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TITLE OF THESIS.....A COMMUNITY COLLEGE.....
.....PROGRAMME INFORMATION.....
.....SYSTEM.....

UNIVERSITY.......ALBERTA.....

DEGREE FOR WHICH THESIS WAS PRESENTED.....Ph.D.....

YEAR THIS DEGREE GRANTED.........1976.....

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THE UNIVERSITY OF ALBERTA

A COMMUNITY COLLEGE PROGRAMME INFORMATION SYSTEM

by

© PETER JAMES MURPHY

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
AND RESEARCH IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATIONAL ADMINISTRATION
EDMONTON, ALBERTA
Fall, 1976

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A COMMUNITY COLLEGE PROGRAMME INFORMATION SYSTEM submitted by Peter James Murphy in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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Date June 15, 1976

ABSTRACT

The purpose of this investigation was to develop a programme information system capable of providing community college administrators and faculty with better quality information regarding the effectiveness of programmes, nature of clientele, and attainment of institutional goals, which would facilitate a more rational approach to planning, policy analysis, programme development and administration. Through the application of the system the study illustrated the types of surveys and analysis that could be conducted by users. The development process employed in designing the system consisted of five stages, namely:

1. Feasibility Study
2. Determining the System's Requirements
3. System Design
4. Test Solution
5. Redevelopment

A flow-charting technique was employed to identify the various processes which were completed during each of these stages. A systems model was used in the design stage as a conceptual framework for obtaining systematically data on the clientele, faculty, and operations of a community college.

The data necessary for completing the investigation were gathered, using several multiple-choice questionnaires, from students, employers, and faculty members in accordance with the student flow dimension of the conceptual model. The data generating process was

simplified by tasks and related activities being represented in a PERT chart, consisting of activity paths that separated the tasks performed by different groups and identified the sequence in which they were undertaken.

Based on a survey of Western Canadian community colleges, the Vancouver Vocational Institute was selected for developing, testing, and evaluating the system. The location of the college, the vocational orientation of its students and the short duration of the programmes it offered were of primary importance in making this selection. Programme and student samples needed for generating data were chosen with the assistance of the divisional chairmen from those associated with the three occupational divisions. Though these samples were not selected by a random procedure, the data gathered during the investigation suggested that they could be considered representative of a division's broader population.

The programme information system developed in this study was designed to initiate a feasibility study, identify the user's needs, and generate relevant data for decision-making. Since existing resources, personnel, and physical facilities were employed whenever possible in its development, expenditures and modifications of organizational practices were minimized. Furthermore, the opportunities and provision for administrators, faculty members, and support staff to become involved in its operation and future development reduces staff resistance to an innovation of this kind. Discussions with faculty members and administrators revealed that the impact and continuance of the system would be dependent, to a significant degree, upon the efforts, enthusiasm, and professional skills of a redevelopment team comprised of members representative of a college staff.

The application of the system at Vancouver Vocational Institute illustrated its usefulness in generating data for defining problems more precisely, identifying the strengths and weaknesses of programmes, developing strategies for improving learning experiences, and establishing satisfactory relations with a college's clientele. It was concluded that the availability of better quality data should encourage administrators and faculty members to adopt a more rational decision-making approach in performing their duties.

ACKNOWLEDGEMENTS

The successful completion of this developmental study was due to the interest, encouragement, and guidance provided by many people, with whom the writer came in contact during the two years of the doctoral programme. Bonds of friendship and congenial relationships established during this period are anticipated, by the writer, to continue for many years hence, which when combined with the gratifying experiences this research produced yielded benefits that far exceeded the writer's expectations. Under these circumstances it is impossible to acknowledge every person who provided advice and support while the study was in progress, therefore the writer seeks the indulgence of the individuals who are not specifically acknowledged for their contribution.

The recommendations, advice and criticisms offered by Dr. E.J. Ingram as thesis supervisor were greatly appreciated, since his comments provided the necessary direction for assuring the various phases of the study progressed smoothly. Furthermore,the friendly and informal atmosphere always existing during conferences, facilitated the exchange of ideas and opinions, thereby many problems were avoided. Also gratitude is extended to Dr. P. J. Miller, Dr. E. W. Ratsoy, Dr. D. M. Richards and Dr. J. E. Seger who were always willing to find time to discuss and propose solutions for resolving problems that continually emerged during the developmental process. Though Dr. J. A. Riffel,the external examiner,only became involved in the research at its completion, his suggestions and comments for improving the quality of the report were greatly appreciated.

This study could not have been undertaken at Vancouver Vocational Institute without the full co-operation and support of the principal, Mr. I. McInnes, the assistant dean, Mr. H. Rerup, and the office manager, Mr. T. McComb, to whom the writer is deeply indebted. Special thanks are extended to Mr. R. Dawson, Mr. R. Maitland, Mr. J. Mitchell, and Mr. A. Wood the divisional chairmen, from whom the author received encouragement, advice, and information that facilitated the advance of the study. Also to the faculty and office staff, the writer offers his gratitude for their willingness to offer assistance whenever requested. A special acknowledgement must be given Mrs. L. Taverner, whose enthusiasm and patience, as a recording clerk, contributed to the success of the follow-up study.

The writer extends to Dr. Miklos, the chairman of the Department of Educational Administration, and all his staff a special thanks for the enjoyable, interesting, and enlightening discussions throughout the two years of the doctoral programme, which enhanced both his professional and intellectural development. Without the co-operation of Mrs. C. Prokop in designing computer programmes, the study would have required more time to be completed. Therefore, the assistance provided was greatly appreciated. Also, Mrs. B. Albrecht and Miss M. Wighi are acknowledged for their competence in typing drafts of this thesis.

Finally the writer extends his deepest gratitude to his wife Helen, whose patience, love, and understanding provided the support and encouragement that was so essential on many occasions during the investigation. Without her assistance the completion of this thesis would not have been possible.

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CHAPTER I

STATEMENT OF THE PROBLEM

I INTRODUCTION

Similar to many other countries, Canada is presently undergoing extensive social, technological, and economic changes that are modifying our way of life to such an extent that it is difficult to foresee the structure and composition of society ten years hence. Naturally, the forces are having a significant impact on the post-secondary educational system of the nation by modifying institutional goals, shaping programmes, curriculum, stimulating demands for accountability, and altering the clientele serviced by different institutions. In an effort to accommodate some of these social forces post-secondary institutions have been offering a wider variety of programmes, expanding student services, and utilizing flexible scheduling innovations designed to more effectively satisfy the needs of people.

One major consequence of advances in technology, as Thornton points out, has been a movement "away from heavy, arduous, unskilled manual labour...toward more highly skilled manual pursuits and intellectual pursuits."[1] This trend has required students, upon graduating from high school, to continue their education at a post-secondary level in order to secure the career they desire. Since many of these students possessed neither the motivation, academic background or career aspirations needed to succeed at University, there emerged a new kind of post-secondary institution known as a community college,designed to satisfy the needs of a group of students who according to O'Banion, "tend to state their goals in more practical vocational terms."[2]

---

[1] James W. Thornton, The Community Junior College (New York: John Wiley and Sons, Inc., 1966), pp. 25-26.

The growth and impact of community colleges has been phenomenal due mainly to their 'open-door' policy, low tuition fees,and neighbourhood location. These factors attracted students who otherwise would not have continued their education beyond high school. As Cosand notes,the two-year community college "opens the door of educational opportunity to millions of students for whom that door would otherwise be shut."[3] A point of view supported by Wattenbarger, maintains that colleges of this kind have popularized and democratized higher education.[4]

Though community colleges have provided industry with the trained manpower it needed to utilize new technologies, have offered a greater proportion of the population an opportunity to experience a post-secondary education and have contributed to sustaining the economic growth of the nation, demands for accountability produced by inflationary pressures and greater competition among public agencies for government financial support have revealed that information on community college activities is scarce. This situation, to some extent, developed as a result of community colleges being viewed favourably by both the public and politicians, who exempted them from the accountability demands that other institutions experienced. Consequently,these colleges were rarely requested to justify in detail how resources were utilized.

---

[2] Terry O'Banion, Teacher for Tomorrow (Tucson: The University of Arizona Press, 1972), p. 46.

[3] Joseph P. Cosand, "Junior College Pros and Cons," in Perspectives on the Community Junior College ed. by William K. Ogilvie and Max R. Raines, (New York: Appleton-Century-Crofts, Educational Division, Meredith Corp., 1971), p. 24.

[4] James L. Wattenbarger, "The Expanding Roles of the Junior and Community College," in Perspectives on the Community Junior College ed. by William K. Ogilvie and Max R. Raines, pp. 53-54.

Various aspects of community colleges' operations such as attainment of institutional goals, effectiveness of programmes, changes in clientele, success of graduates,and employers' satisfaction with the training provided,need to be examined more critically if they are to serve the post secondary educational needs of society as effectively as in the past. In view of the anticipated continuance of inflationary pressures, administrators and faculty members must employ a more rational decision-making approach to resolve their problems. At present,decision-making in most community colleges is a process of 'muddling through' with obsolete regulations, 'rule of thumb' practices, and personal bias acting as the basis for solving a wide variety of problems which,naturally,are unsatifactory procedures for allocating resources, planning change or formulating new policies.

A logical examination of the decision-making process suggests that the quality and quantity of information available to those assigned the responsibility of making decisions should determine whether the solution selected for resolving a problem is the most appropriate. Relevant information regarding an issue may either reduce the degree of uncertainty surrounding it or indicate that certain solutions contain elements which make them inappropriate. In reality however, the political implications of alternative strategies are usually given greatest priority, which often results in the most rational solution to resolving a problem not being selected.

Frequently decision-makers do not possess sufficient information on a problem, the alternative strategies available, or the consequences of different solutions. Therefore, they are unable to counteract the influences of various political groups. In order for community college personnel to become more effective decision-makers, it is essential that they have access to an information system capable of generating useful data quickly. Only then is it possible for them to adopt a more rational approach to dealing with the pressures, demands, and challenges being generated by social, economic, technological, and political changes.

II THE PROBLEM

The primary purpose of this investigation was to develop a programme information system capable of assisting a community college to satisfy, more adequately the post-secondary educational needs of its clientele and certain manpower needs of society. Through the application of the system, the study investigated how the data generated might be employed to evaluate vocational programmes, examine instructional goals, and furnish recommendations for improving programmes.

III OBJECTIVES

To attain the purposes of this investigation, analysis focused on satisfying the following six primary objectives:

Objective 1.0: To establish whether a programme information system would be beneficial to the staff of a community college.

Objective 2.0: To establish the user's requirements of a programme information system.

Objective 3.0: To design a simple, flexible, and inexpensive information system for dealing with issues related to community college programmes.

Objective 4.0: To investigate changes in organizational procedures necessary for an information system to become operational.

Objective 5.0: To examine how continuance of the programme information system might be insured after pilot-testing.

Objective 6.0: To illustrate how the data generated by the programme information system could be utilized to study areas of interest to a college.

IV THE METHODOLOGY

The objectives of the study were satisfied by employing a development process consisting of five stages, namely:

1. Feasibility Study
2. Determining the Systems Requirements
3. System Design
4. Test Solution
5. Redevelopment

By completing these operations, a simple yet effective programme information system was established for a community college. A systems approach was employed, in the design stage, to develop a data generating base for the system, while expenditures were minimized by utilizing existing facilities, resources, and personnel whenever possible.

The Vancouver Vocational Institute was selected as the college for developing, testing, and evaluating the programme information system, after completing a comprehensive survey of community colleges in Western Canada. The location of the college, the vocational orientation of its students, and the short duration of the programmes it offered were of primary importance in making this selection. The limited resources available for conducting the investigation were also taken into consideration in choosing this institution. Though the samples for study were not selected using a random procedure, the data gathered during the investigation suggested that these samples could be considered representative of a division's broader population.

The necessary data for completing the study were gathered from students, faculty members, and employers by means of several multiple-choice questionnaires, containing items which had been identified in the literature and reported by the faculty as being important for day-to-day decision-making, evaluation, planning, and curriculum developments. All instruments were pilot-tested to reduce ambiguity and to assess their reliability.

The flexibility and usefulness of the system was illustrated by examining five problems which were identified as warranting study by the faculty, professional educators, and writers on community colleges. Due to the vast quantity of data available, analysis was focused on studying the problems at the college level; nevertheless, several issues were examined at the divisional level to illustrate the comprehensive kind of analysis that could be undertaken using the system.

V SIGNIFICANCE OF THE STUDY

Though community colleges have successfully extended the opportunity to experience a post-secondary education to people from all strata of society, inflationary pressures, along with a growing complexity of internal operations and expansion of programme offerings have begun to have an adverse impact on such colleges and have reduced their effectiveness. One factor that has contributed to this state of affairs has been a shortage of relevant data for planning, organizing, coordinating and controlling organizational activities, a situation which has become more apparent as demands for accountability have intensified. The efficiency of data characterizing most educational enterprises was noted by Thomas, in his book The Productive School, as follows:

> State legislatures often are required to make decisions involving hundreds of millions of dollars, in the absence of the most rudimentary information about programmes and about educational outcomes. Even local school systems have an inadequate flow of data, and school boards must base their choices on judgments of administrators, often unsupported by sufficient information.[5]

The quality of decisions, however, as Clarke et al, emphasize, "is directly related both to the quantity of relevant information available to the decision-maker and to the quality of the analysis and synthesis of this information".[6]

---

[5] J. Alan Thomas, The Productive School: A Systems Analysis Approach to Educational Administration (Toronto: John Wiley and Sons, Inc., 1971), p. 104.

[6] Neil Clark, et al., A Systems Approach to Follow-Up Studies in Community Colleges A College Administrator Project (Edmonton: Department of Educational Administrator, University of Alberta, 1973), p. 13.

A variety of information systems is available for generating data on community college activities. However, many administrators have not encouraged their being used extensively in the institutions they serve. This lack of interest in information systems has, to a significant extent, been due to administrators perceiving information systems as being too complex, too comprehensive, and too expensive for their institution's needs. The development of an information system is a joint venture involving administrators, and systems analysts, which means "both must co-operate, understand each other's capabilities and limitations, and support each other throughout the development process."[7] By adopting this approach, administrators come to appreciate the benefits an information system can yield.

The programme information system developed in this investigation offers community colleges a simple, flexible, and inexpensive means of generating useful data. Furthermore, the development process employed requires the involvement of staff from all strata of an institution. Also, the data produced facilitates programmes and services being established that better satisfy the educational needs of adults and manpower requirements of local industry, as well as enable administrators to justify policy changes, support requests for financial assistance, and define more precisely a college's domain.

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[7] Khateeb M. Hussain, Development of Information Systems for Education (Englewood Cliffs: Prentice-Hall, Inc. 1973), p. 6.

Over the past ten years a number of studies have been conducted in Canada, by Collin (1971), Dennison and Jones (1969, 1971), Ottley (1971), and Ramer (1974), to investigate the activities of community colleges, determine the characteristics of the clientele they attract and establish the effectiveness of the programmes offered. In most instances, these investigations have been 'one-shot' affairs that have had limited relevance outside the institution or time period when they were undertaken. Theoretical models have also been conceptualized to explain various aspects of organizational behaviour in colleges, but few have been tested empirically to establish the extent to which they represent reality. A developmental study of the kind undertaken in this investigation, in contrast to the research under discussion utilizes theory to produce models, techniques, and processes that practicing educators can employ to resolve problems preventing their institutions from functioning effectively. Furthermore, the scope and design of these studies often yield products that can be used in a variety of settings and applied to examine a wide range of issues.

VI ASSUMPTIONS

Though the adults interviewed and programmes evaluated were not selected by a random procedure, the data gathered revealed that members of a sample chosen from a specific division possessed a number of common characteristics. Therefore, it was assumed for statistical purposes, that the samples selected for study were representative of a division's broader population.

The responses of students, faculty members, and employers were naturally subject to bias; however, it was assumed that participants answered the questionnaires to the best of their knowledge and ability. All respondents were encouraged to express their personal opinion by a coded questionnaire which offered them anonymity and a guarantee that any information they provided would be reported in a form that prevented any individual being identified.

VII DELIMITATIONS

Vancouver City College offers a wide variety of vocational university tranfer, general education, and special interest programmes through its four campuses. Due to limitations of time and resources, the focus of this investigation was limited to studying short programmes of ten months or less in duration provided by Vancouver Vocational Institute, the vocational campus of the College.

At present Vancouver Vocational Institute is organized for administrative purposes into three major divisions, namely:

Business and Health Division
Service Division
Technical Division

Though these divisions are presently composed of several departments, there were indications that some will be consolidated into larger units in the near future. Only those faculty members, students, and employers associated with the departments that offered the programmes under review were invited to participate in the study. Except for the senior administrators of the College, no consideration was given to the recommendations, opinions, or evaluations of any other group.

VIII LIMITATIONS

In this investigation the procedures, instruments, and methodologies employed were not viewed as permanent or definite, but rather as the initial state of a development process directed towards establishing a viable programme information system. Under these circumstances, the design of the data generating system was modified while the investigation was in progress.

The students, staff members, administrators, and employers, who participated in the study, expressed subjective evaluations when they responded to questionnaire items. Consequently, any findings based on the application of the system were only tentative, because they could be completely modified or even rejected by different samples. By using the system over several years, it would, however, be possible to determine whether participants were in general agreement as to the effectiveness of programmes and the emphasis that should be placed on various instructional goals.

Since Vancouver Vocational Institute was selected as the institution where the system would be developed and experimentally applied, certain unique characteristics of that College were incorporated in the structure of the information system and data generating model. Discussion, therefore, tended to focus on this institution which, in many respects, was not representative of most community colleges. Consequently, findings may not apply to the same extent in a different institution.

Finally, though many factors were examined in this investigation that influence a student's success both at college and in the labour market, numerous other variables that were not given any consideration also effect achievement at college, satisfaction with studies, and job performance. Furthermore, the investigator acknowledges that the vocational programmes offered by a community college were designed to accomplish a wider range of goals than those examined in this study. The instructional goals selected, however, were identified as being of primary importance in community colleges in a comprehensive investigation on goals conducted by the National Laboratory for Higher Eduction.[8]

IX DEFINITION OF TERMS

The terminology employed in this investigation was used extensively in the literature reviewed and was therefore assumed to be familiar to administrators, instructors, government officials and university faculty members associated or involved with community colleges. However, the investigator recognizes that certain readers might find the terms difficult to comprehend ;consequently, some of the more important ones have been defined to clarify the context in which they were used.

Community College

A community college is an educational institution that is community oriented. Leyland L. Medsker, in his study of the United States Junior Colleges, described the comprehensive community college as a post-high school institution which:

1. Offers a variety of educational programmes of an academic and

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[8] National Laboratory for Higher Education, Goal Setting for Organizational Accountability: A Leadership Strategy (Durham: Junior and Community College Division, National Laboratory for Higher Education, 1972).

occupational nature, day and evening for full-time and part-time students;

2. Provides an opportunity for students to make up educational deficiencies;
3. Has a liberal admissions policy;
4. Emphasizes a well developed guidance programme; and
5. Performs a variety of special services to the community.[9]

Hence, the function of a community college is to serve the post-secondary needs of the community in which it is located, and serve adults who reside in that community, by providing a wide variety of programmes in many fields of study.

Community College Students

The students who attend community colleges according to O'Banion vary considerably in terms of their socio-economic background, employment experiences, and educational achievements.[10] This diversity naturally makes describing a typical community college student difficult. In this investigation, the data gathered indicated that students enrolled in a specific occupational division possessed similar social, educational, and employment characteristics.

Congruence Evaluation

Similar to most organizations, educational institutions define specific objectives their services and activities are designed to achieve, but usually disturbances in the system prevents the objectives being attained as desired. Congruence evaluation is a means of establishing the extent an intended performance level has or has not been attained, it is a micro form of analysis that established the degree of discrepancy between what 'should be' and 'what is'.

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[9] Leyland L. Medsker, The Junior College: Progress and Prospect (New York: McGraw-Hill Book Company Inc., 1960), p. 203.

[10] O'Banion, Teacher for Tomorrow, p. 37.

Contingency Evaluation

Often adjusting an existing system fails to yield desired goals. Consequently, certain features must be either redesigned or replaced if any improvement is to occur. Discrepancies between what is potentially possible, and what is actually probable in the future, as a result of introducing an innovation, is determined by contingency evaluation, a future planning technique that is usually comprehensive in scope.

Developmental Study

Since education is a complex and often intangible process, frequently in a continuous state of change, it is usually difficult and unrealistic to study its numerous elements with pure scientific methods. An alternative research procedure, known as the developmental approach, is being employed more extensively in education, since it is more applicable for examining change processes. Using this longitudinal investigation procedure, educators are able to study either a specific stage of growth or the relationship between different stages of growth. Data gathered at one stage may also be employed to determine the consequences of modifying environmental conditions, patterns of behaviour, or production processes at another point in time. By observing the outcomes of such changes, further refinements can be introduced until the most satisfactory or optimal situation is reached. This developmental approach was employed in this investigation to establish an effective programme information system for community colleges.

Feasibility Study

A feasibility study is designed to determine whether a proposed modification of the existing system or introduction of an innovation can be accomplished, subject to the constraints of the system. The purpose of this analysis is to reduce the probability of an unsuitable organizational change being undertaken and to identify problems that have to be resolved in order for the proposed change to be effective.

Flowchart

A complex sequence of activities can often be simply presented or described by a flow chart, which expresses, diagrammatically, the various components of a series of activities by a set of recognized symbols. Directional arrows indicate the order in which events occur and decision points facilitate revision and modification of an activity. Therefore, as Hussain notes flowcharts ". . . facilitates the understanding of complex problems. . . . by expressing quickly and graphically the logic involved."[11]

Information

In the fields of computer science, systems analysis and management information systems, the words 'data' and 'information' are considered to have different meanings. Hussain differentiates between these two basic elements of an information system by stating that "data consist of a set of characters or signals to which a significance can be assigned. Information, on the other hand, is selected data that have been processed to make them meaningful".[12] Though it is important, in certain circumstances, to differentiate between data and information, the investigator considers a distinction of this kind is unwarranted in this developmental study. Therefore the terms 'data' and 'information' are viewed as being synonymous.

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[11] Hussain, Development of Information Systems for Education, p.25.

Instructional Goals

A community college offers a wide variety of programmes designed to satisfy the post-secondary educational needs of a community in which it is located, and the citizens who reside in that locality. Naturally, these needs are numerous, complex, and interrelated, which makes it difficult for a college to provide the programmes and services that will satisfy them. In an effort to accomplish this difficult task, educators specify the purpose of their activities in terms of broad instructional goals. In this study, instructional goals will refer to the broader purposes of education at the community college level such as:

'developing creativity'
'improving self concept'
'stimulating interest in new areas'
'improving critical thinking'

Though such goals are intangible they do form a base for curriculum development.

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[12] Ibid., p.81.

Open-Door Policy

A community college allows adults to enroll in any programme it offers, if they can show that they are capable of mastering the skills and knowledge involved. An open-door policy of this kind is based on the assumption that a large number of adults would benefit from a post-secondary education if they were given the opportunity to attend college.

Programme Information System

The type of system employed by an organization to generate information is determined by the nature of the user, the hierarchical level at which the information will be employed,and the characteristics of the information needed. A programme information system, based on these criteria, is an information system that provides data related to programme activities which instructors, department heads,and senior administrators need for making decisions within their sphere of influence. Though an information system of this kind generates rather specialized micro-information, individuals performing a variety of duties, at different levels in an organization, find it extremely useful. A management information system, in contrast, is usually employed,to produce macro information about an institution, by senior administrators, who initiate change, provide leadership, direct growth,and assess an organization's performance.

X AN OUTLINE OF THE THESIS

The purposes of this investigation, its significance and constraints to which it was subject have been presented in Chapter I so as to define the scope of the study. A survey of the literature pertaining to community college activities, clientele and programmes is presented in Chapter II, which reveals a scarcity of relevant data for decision-making in most community colleges, and need for a simple but effective information system.

In Chapter III the conceptual framework for the investigation is established that consists of a synthetic model based on systems theory and a development process for designing information systems. Outlined in Chapter IV are the procedures employed to select samples, develop instruments and gather data for conducting the study.

Presented in Chapter V is a detailed description of the five phases constituting the development process utilized to establish the programme information system. An illustration of how the system might be applied can be found in Chapter VI, where five areas identified as being of general concern to professional educators are studied in some detail. In Chapter VII the investigation is summarized, findings of analysis presented, conclusions reported, recommendations outlined, and areas for future research documented.

CHAPTER II

LITERATURE REVIEW ON COMMUNITY COLLEGES AND INFORMATION SYSTEMS

I INTRODUCTION

One of the most recent and dynamic developments in education has been the phenomenal growth of community colleges. These educational institutions have exposed hundreds of young people who would not have continued their education beyond high school, to a post-secondary education. The great success of community colleges has been due to the fact that the services and programmes they offer have been in great demand by the adult population. If community colleges are to maintain or improve on their past achievements, there is growing evidence that more information must be available for decision-making. Many community colleges do not possess an information system capable of generating the data needed by administrators and faculty members to adequately cope with a wide variety of institutional problems. The purpose of this investigation, as outlined in Chapter I, was to develop a programme information system which would provide community college personnel with the data they need to effectively perform their duties.

This literature review provides a brief, but sufficient overview of research findings, existing knowledge, and educators' opinions on six areas, which in the opinion of the investigator were important for developing a programme information system. Firstly, literature on the phenomenal growth of community colleges provides a description of the setting in which the investigation was conducted. Secondly, the characteristics of adults attending community colleges were studied to indicate the diverse nature of the clientele these institutions serve. Thirdly, literature was reviewed on programme goals to secure a procedure for empirically investigating the outcomes of the instructional process. Fourthly, evaluation models were examined to identify the most promising approach, presently available, for assessing the effectiveness of college activities. Fifthly, a survey of follow-up studies, conducted since the early sixties, was completed to discover whether investigations of this kind were an essential phase of evaluation. Finally, information systems presently available on the market were examined to determine the benefits, inadequacies, and applications of existing systems. Though the material reviewed was not exhaustive of the literature available, the articles studied yielded sufficient information for clearly defining the problem, establishing a conceptual framework, devising a methodology, selecting a research design,and identifying issues of concern to community college personnel.

II GROWTH OF COMMUNITY COLLEGES

Admission to most community colleges, in accordance with the equal educational opportunity philosophy, has been 'open-door'. As a result, adults attracted to these institutions extend from teenagers, who have just graduated from high school, wanting to acquire specific skills for employment in the labour market, to senior citizens seeking activities that will assist them to constructively utilize their newly acquired leisure time. A policy of open access to higher education does not mean, however, that every adult should attend college. The Carnegie Commission notes that "many will want to attend, and there will be others who will not benefit sufficiently from attendance to justify their time and the expense involved".[13] Thus, it was recommended that a policy of universal access to higher education should be adopted by all state legislatures, but not one of universal attendance.

The 'open-door' policy has produced, in most community colleges a population whose members vary considerably in their aptitudes, abilities and aspirations. Colleges have been offering a wide variety of programmes, in an effort to satisfy the needs of such a diverse clientele. However, when administrators and faculty members recommend that a college should offer certain programmes, they have to give adequate consideration to the employment opportunities existing in the community as well as the needs of young adults. A community college as Thornton accurately points out, "must not try to offer every possible course in its early years, but only those which can be economically and prudently justified".[14] If a community college is to satisfactorily serve the community in which it is located, adequate provision must be made for assessing the growth trends of local industry, changes in technology, former students in various occupational settings, and the nature of new skills being demanded by employers.

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[13] Carnegie Commission on Higher Education, The Open-Door Colleges: Policies for Cummunity Colleges (New York: McGraw-Hill Book Company, 1970), p. 15.

[14] Thornton, The Community Junior College, p. 38.

Though most community colleges have expanded their programme offerings gradually, they have usually been reluctant to discontinue a programme once it has been published in the college calendar. The result has been that in most colleges a number of programmes have such small enrollments, that it is difficult to justify their existence. Administrators must ensure, therefore, that there is an adequate demand for graduates from the various programmes offered by their institution. Based upon the information they gather, priorities should be established, and, as Field suggests, resources should be allocated in terms of these priorities.[15]

A community college's guidance and counselling service obviously plays a major role in assisting students choose programmes that are compatible with their abilities, as well as their expectations, and aspirations. The right of young adults to choose their own programmes of study is supported and acknowledged by community colleges, but allowing them to make their selection without assistance according to Thornton:

> . . . is a travesty of freedom unless the student has adequate information about the nature and purpose of the several available curriculums, about his own personal and educational qualities and about employment opportunities for those who complete the various courses.[16]

If a young adult is to choose a programme of studies that is in his best interests, a guidance counsellor is often the only person with whom he personally relates who can provide the information he needs in order to make a sound decision.

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[15] Ralph R. Fields, The Community College Movement (New York: McGraw-Hill Book Company, Inc., 1962), p. 325.

[16] Thornton, The Community Junior College, p. 39.

The 'open-door' policy, diversity of programmes, and inadequate guidance have contributed to community colleges being characterized by high attrition rates. Often as many as fifty percent of the students who enroll in some programmes fail to complete their studies; a wastage of human resources that no developing nation can allow to continue. Community colleges, according to Monroe, have a dual responsibility:

> One is to expand opportunities for post-secondary education as widely as possible. The other is to hold as many students who enroll as freshmen as long as possible or until the student believes he has received full value from the programme.[17]

Once students have been attracted to a college, then it is the faculty's responsibility to encourage as many individuals as possible to complete their studies.

Many young adults attend community college to secure occupational skills which enable them to become productive members of the labour force upon graduation. The type or occupational programmes offered by a community college, as noted previously, should be dependent upon the occupational needs of the local community, and should be different from the vocational programmes offered by other institutions of higher education in the vicinity. In order to satisfy the manpower needs of the community they serve, most colleges offer a variety of programmes that usually vary in length from one month to two years, depending upon the level of skills and knowledge needed for a specific occupation. Often, short programmes are so designed that a young adult may continue his education at evening school or on a part-time basis. As our economy increases in size and complexity, community colleges, in the opinion of The Carnegie Commission, should be prepared to expand their programme offerings both in scope and variety.[18]

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[17] Charles R. Monroe, Profile of the Community College (San Francisco: Jossey-Bass Inc., Publishers, 1972), p. 209.

If the demand for higher education continues, attendance at a post-secondary educational institution, in the future, may become as commonplace as graduating from high school today. The need for individuals to possess a post-secondary education of some kind to secure a job, in Monroe's opinion, "will cause the community college to be accepted as a necessary, indispensible segment of public education".[19] Community colleges, like other institutions of higher education, will be increasingly pressured to account for how they allocate funds they receive; but, since the programmes they offer are in great demand, they will suffer less than many other types of institutions.

Though community colleges appear to be in a favourable position financially, they have to maintain their credibility with the public and legislature, who require that programmes and services are periodically evaluated to determine their effectiveness and to identify those that need to be improved or discontinued. Johnson maintains that if the future development of colleges is to be in a direction most beneficial to our society, "rigorous and vigorous evaluation are greatly needed - preferably college-wide in scope and involvement, hopefully involving the total faculty".[20]

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[18] Carnegie Commission on Higher Education, The Open-Door Colleges: Policies for Community Colleges, p. 19.

[19] Monroe, Profile of the Community College, p. 383.

[20] Johnson, B. Lamar. Islands of Innovation Expanding: Changes in the Community College (Beverly Hills: Collier-Macmillan Ltd., 1969), p. 311.

If community colleges are to continue playing a major role in society, there is growing evidence that faculty members, administrators, and support staff must be better informed about a college's clientele, the effectiveness of programmes, and the adequacy of student services. Though a community college requires students to provide personal information during orientation and admission, many institutions still only possess broad and vague descriptions of the students in attendance. The availability of recent, detailed, and accurate information on the student population ensures that future growth, to a greater degree, will be in harmony with the educational needs of the populace.

III CHARACTERISTICS OF COMMUNITY COLLEGE STUDENTS

The students attending most community colleges vary considerably in terms of their socio-economic background, intellectual abilities, vocational aspirations, maturity, motivation, and study habits. O'Bannion maintains that due to this great diversity among students, it is impossible to describe an average student who attends a community college, though there is evidence as he notes that "show them to be representative of the population in their communities".[21]

A description of the clientele served by a specific college is important for planning, curriculum development, and policy changes, since without such information, faculty members and administrators have little hope of providing educational programmes and services that will satisfy the needs of the students who enter the college every year. Need for this kind of information is stressed by Thornton, who maintains that "the community junior college cannot be understood completely without a clear, factual and unbiased understanding of its students".[22] Also Blocker et al suggest that if colleges are to achieve their goals they must have an adequate understanding of the abilities, attitudes, and experiences of the students they serve.[23]

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[21] O'Bannion, Teacher for Tomorrow, p. 37.

Under the direction of Clark, a comprehensive investigation was undertaken in 1960, to study the socio-economic background of students attending several post-secondary institutions in California. At the University level he found that 87 percent of the students were from upper white collar families, while in contrast, only 38 percent of the students attending a community college were members of the same socio-economic group.[24] The literature reviewed indicated that similar conclusions had been reported by other research studies.

These findings on the socio-economic background of community college students reveal that such colleges are democratizing post-secondary education, which as Medsker suggests "may be salvaging certain talents for society that otherwise would be lost".[25] Obviously, community colleges are tapping a reservoir of potential human capital that, in the past, has not been exploited.

Since community colleges first commenced operation, a considerable quantity of research and time has been devoted to studying the academic aptitude and ability of students who attend such institutions. Most of these studies, according to Monroe, have reported that community college students, in terms of academic ability, tend to be inferior to their peers attending four year post-secondary institutions.[26] However, O'Bannion questions the validity of these findings, due to the fact that existing aptitude and achievement tests are biased towards traditional curricula and academic students. Furthermore, as he points out, "statistical averages conceal the extraordinarily wide range of abilities of community junior college students,"[27] Therefore, it is inappropriate to study the clientele of a community college in terms of an average student.

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[22] Thornton, The Community Junior College, p. 146.

[23] Clyde E. Blocker, Robert H. Plummer, and Richard C. Richardson, Sr., The Two-Year College: A Social Synthesis (Englewood Cliffs: Prentice-Hall, Inc., 1965), p. 111.

[24] Burton R. Clark, The Open Door College: A Case Study (New York: McGraw-Hill Book Company, 1960), p. 54.

[25] Medsker, The Junior College: Progress and Prospect, p. 42.

The literature reviewed indicated that most community college students were very similar to the general population of the community from which they were drawn, in terms of their academic ability. This was a contrast to most other post-secondary institutions. Based on this finding, several writers emphasized that it was unrealistic to compare community college students with their peers attending University in terms of academic achievement. This group recommended that community college students should be viewed as individuals with a wide range of abilities rather than less able members of society. O'Bannion notes it is regrettable that:

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[26] Monroe, Profile of the Community College, p. 188.

[27] O'Bannion, Teacher for Tomorrow, p. 41.

> Research on the skills of community junior college students has neglected to inventory special skills - mechanical, coping social, artistic, etc. which may be useful in distinguishing types of students and planning programmes for them. [28]

Obviously, there is presently a great need in community colleges for instruments that will identify many of these special abilities.

Most of the research conducted on the personality of community college students, according to the literature, has usually compared these students with individuals attending institutions offering advanced programmes of study. The findings of these studies have generally revealed, according to Cross, that "in general junior college students are more conventional, less independent, less attracted to reflective thought, and less tolerant than their peers". [29] Again O'Bannion challenges the validity of such a statement, due to the fact that "it is based on the 'average student', although . . . community college students are composed of various grouping which lose important identifying traits when merged". [30] This viewpoint is supported by Koos, who stresses that sweeping generalizations of this kind have little worth. [31]

The literature reviewed, on community college dropouts, suggested that though students discontinue their studies for a variety of reasons, a large proportion often appear to be related to personal issues rather than a dissatisfaction with college facilities or programmes. According to Thornton, for example, most students withdraw from college because of:

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[28] Ibid., p. 43

[29] Patricia Cross, The Junior College Student: A Research Description (Princeton: Educational Testing Service, 1968), p. 32.

[30] O'Bannion, Teachers for Tomorrow, p. 44

[31] Leonard V. Koos, The Community College Student (Gainesville: University of Florida Press, 1970), p. 322-323.

> . . . ill health, financial need, family moving away, finding employment, too much outside work, illness at home, lack of transportation, marriage, and need to work more to keep up car payments.[32]

Due to the personal nature of these problems, several researchers maintained it was difficult for the personnel of a college to assist students resolve them. Though writers differed in opinion as to which factors were the major causes of discontinuance, there was general agreement among them that this was a complex issue on which we have limited knowledge.

The data available suggests that more than one factor usually compels a student to drop out. Based on a study conducted at Yakima Valley College, Rice and Scofield have proposed that:

> Instead of simple causes there seems to be a cluster of interrelated factors acting on the student and the reported reason may be the precipitating event which culminates a long list of predisposing causes.[33]

While Merigold, noted in his research on dropouts that "the withdrawing student is plagued by a complexity of reasons . . . acting upon him from every possible angle, intellectually, emotionally, psychologically and even morally".[34] Under these conditions it is not surprising that the dropout problem has been found difficult to resolve.

According to the literature reviewed more information must be obtained regarding the characteristics of the clientele served by an institution so the educational needs of students could be better assessed.

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[32] Thornton, The Community Junior College, p. 156

[33] Gary A. Rice and William Scofield, "A Contrast Between the Successful and Dropout Students at Yakima Valley College," (Olympia: Washington State Board for Community College Education, 1969), p. 22.

[34] Frank Merigold, The Development and Testing of a Scale to Identify Male Droputs at Liberal Arts Colleges, (Washington E.C.: U. S. Department of Health, Education and Welfare, 1967), p. 7.

Similarly, a number of writers recommended that institutions must devote more attention to defining the goals and objectives of the programmes they offered. This group of researchers maintained that information of this kind would enable community colleges to determine whether students were being exposed to suitable learning experiences.

IV COMMUNITY COLLEGE PROGRAMME GOALS

One of the major functions of a community college is to assist students develop their potential abilities in a variety of ways that will enable them to secure productive employment, cope with the stresses of a technological society, be more tolerant of other peoples' points of view, develop into good citizens, and lead worthwhile lives. Usually the purpose of college is stated in terms of broad abstract institutional goals and specific instructional objectives. These official goals and objectives, though specifying the general purpose of a programme, may not accurately reflect what faculty members are trying to achieve. In most instances, as Hall notes, "the operative goals reflect the official goals, in that they are abstractions made more concrete".[35] However, Hall qualifies this statement by pointing out that "operative goals can evolve that are basically unrelated to the official goals".[36]

By studying both the official and operative goals of a college, it is possible to identify the direction in which the institution is trying to guide the growth and development of the clientele it serves.

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[35] Richard H. Hall, Organizations: Structure and Process (Englewood Cliffs: Prentice-Hall, Inc., 1972), p. 84

[36] Ibid.

Programme goals and objectives as Bloom et al point out, "do not . . . comprise all of the outcomes of instruction since it is quite impossible in most instances . . . to anticipate the full range of results".[37] However, if an educational institution is to function effectively, faculty members and administrators should be aware of, what goals and objectives they are striving for. Without established goals organizations, according to Perrow, "are subject to vagrant pressures from within and without",[38] which often results in a waste of resources and effort.

Most community colleges attempt to achieve multiple goals which often overlap. Consequently, it is frequently difficult to isolate one goal from another. Similarly the attainment of one goal, as Hall reports, "may operate against [be dysfunctional for] the attainment of another".[39] Thompson points out:

> Goals for the organization . . . may be held by individuals or categories having no affiliation with the organization. In this way clientele may seek a different sort of service from the organization; investors may seek a more profitable or safer domain for the organization; members of the environment may seek to define the domain as illegitimate; or members of different departments within the organization may have conflicting views of desired future domains.[40]

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[37] Benjamin S. Bloom, J. Thomas Hastings and George F. Madans, Handbook on Formative and Summative Evaluation of Student Learning (New York: McGraw-Hill Book Company, 1971), p. 19.

[38] Charles Perrow, Organizational Analysis: A Sociological View (Belmont: Brooks-Cole Publishing Company, 1970), p. 173.

[39] Hall, Organizations: Structure and Process, p. 88.

[40] James D. Thompson, Organizations in Action (New York: McGraw-Hill Book Company, 1967), pp. 127-128.

These conditions often result in the suboptimization of goals. The abstract nature of institutional goals does have some benefits as noted by Kast and Rosenzweig that:

> Clear-cut goals and mechanistic programs for achieving them may discount the human element and lead to a sterile environment which stifles individual initiative and results in under utilization of human resources. [41]

Thus, the vagueness associated with institutional goals provides the necessary flexibility that is needed to accommodate the different personalities, value systems, and individual differences of people working in the system.

Unclear goals, according to Kast and Rosenzweig, also "makes it possible to work toward goals by many different means". [42] Consequently, programmes can be modified to accommodate changes which are always occurring in a dynamic society. If goals were defined in precise terms, individuals assigned the task of instructing programmes would find it difficult, in many instances, to cater for the individual needs of students. Katz and Kahn emphasize that "an organization which depends upon its blueprints of prescribed behavior is a very fragile social system". [43] Therefore, only when goals are abstract and vague is it possible for members of an organization to introduce changes with minimal conflict and resistance.

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[41] Fremont E. Kast and James E. Rosenzweig, Organization and Management: A Systems Approach (New York: McGraw-Hill Book Company, 1970), p. 441.

[42] Ibid., p. 442

[43] Daniel Katz and Robert L. Kahn, The Social Psychology of Organizations (New York: John Wiley and Sons, Inc., 1966), p. 338.

Institutional goals often change in importance over time or at certain stages during a specific time period due to three major reasons:

1. Direct pressure from external forces, which leads to a deflection from the original goals
2. Pressure from internal sources
3. Changes in environmental and technological demands.[44]

Periodically, community colleges should obviously assess whether its official and operative goals are congruent with changes in demand for educational services generated by these internal and external pressures. Without this continuous evaluation,community colleges have no objective indication as to whether the resources provided by the government, expertise of its staff,and student time are being effectively utilized.

The literature review revealed that organizational goals have been the focus of research, discussion,and study for several decades. Similar to many educational issues,research on this topic has mainly been conducted at a theoretical level, which has yielded findings that have been of limited value to personnel responsible for instruction. In 1967,Gross and Grambsch undertook a comprehensive study which was one of the first investigations to empirically examine the institutional goals of a post-secondary institution. According to Uhl this investigation was a major advance in the study of organizational goals, since it illustrated that the goals of an educational institution could be examined empirically.[45]

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[44] Hall, Organizations: Structure and Process, p. 87.

[45] Norman P. Uhl, Identifying Institutional Goals (Durham: National Laboratory for Higher Education, 1971), p. 5.

The Educational Testing Service, in the early sixties, developed a goal inventory (Institutional Goal Inventory) based on the pioneer work of Gross and Grambsch. The purpose of this inventory was to assist post-secondary institutions cope with demands for greater accountability being produced by inflationary pressures.

The goals of a community college, which have been discussed up to this point, are usually defined in broad and often abstract terms. In this form, goals are difficult to achieve at an operational level. Therefore, colleges specify the purposes of a programme in terms of fairly precise objectives or programme goals. According to Bloom, Hastings and Madans:

> The short term objectives must be started in an unambiguous way so that they are clear not only to the teacher himself but also to his colleagues with whom he may wish to share his observations.[46]

In order to assess whether the programmes offered by a community college are attaining specific goals the purposes of learning experiences must be clearly defined.

One of the most recent investigations undertaken to identify the major instructional goals of higher education programmes was conducted by the National Laboratory.[47] The purpose of this study was to develop an instrument that would enable administrators and facutly members to define more, specifically, the objectives of their activities and to gain considerable insight as to the importance of different outcomes.

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[46] Bloom, Hastings and Madans, Handbook on Formative and Summative Evaluation of Student Learning, p. 23.

[47] National Laboratory for Higher Education, Goal Setting for Organizational Accountability: A Leadership Strategy.

The general procedure for using the GOALS instrument, developed by the National Laboratory, is for representatives of a community college to attend a workshop. All participants are requested to place in order of priority the overall purpose goals, instructional ends goals, and management support goals by means of a Q-sort technique. According to Bosetti and Fraser, "the negotiations and open communications required to achieve consensus in small groups constitutes what might be termed the major learning portion of the task,"[48] since participants are required to be able to justify assigning a certain priority to a specific goal. Though the GOALS instrument is still an experimental research tool, the investigations where it has been employed have revealed it to be a very useful instrument for identifying a post-secondary institution's goals.

Though a study of programme goals provides administrators with useful information, evaluation must be viewed in broader terms if more than one outcome set is to be examined. Since educational programmes produce a variety of outcomes, analysis must focus on specific ones, if any type of assessment is to be satisfactorily considered. This task can be accomplished, with some degree of precision, by limiting the scope of evaluation to the confines of a specific evaluation model.

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[48] Reno Bosetti and Ian Fraser, "Goals in Organizations", (Seminar paper presented in the Department of Educational Administration, University of Alberta, Edmonton, Alberta, 1970), p. 6.

V PROGRAMME EVALUATION MODELS

Though community colleges require students to provide some personal information at registration, encourage faculty members to secure from colleagues in industry their evaluation of programmes and form advisory boards to assist in developing programmes, most institutions possess only limited knowledge of the clientele they serve, the effectiveness of programmes, and employers' opinions of the training provided. One of the major reasons for this state of affairs, according to the literature reviewed, is that developing a satisfactory model for evaluating programmes and gathering information by students is time consuming, expensive, and difficult. Furthermore, most members of a college staff find they have insufficient time to cope with their regular instructional duties, to assist students with personal problems, and to keep up-to-date with advances in their fields of expertise. Due to these conditions, very few instructors become involved in evaluation beyond assessing the assignments completed by the students they instruct.

In most institutions of higher education, evaluation has been neglected, which has resulted in many senior administrators, heads of departments, and faculty members being unaware as to the extent to which programme objectives are being attained, student needs satisfied, and resources effectively utilized. According to Tyler, this situation could be improved, by colleges developing and introducing comprehensive evaluation programmes. These programmes, in his opinion, should be designed to serve a broad range of purposes such as:

1. Make a periodic check on the effectiveness of the educational institution;
2. Validate the hypotheses upon which the educational institution operates;
3. Provide information basic to effective guidance of individual students;
4. Provide a certain psychological security to the school or college staff, to the students, and to the parents;
5. Provide a sound basis for public relations; and
6. Help both teachers and pupils to clarify their purposes and to see more concretely the directions in which they are moving.[49]

In order to attain the objectives proposed by Tyler, to any significant degree, evaluation must obviously be a continuous process involving all members of a faculty. If an evaluation programme is to be comprehensive, continuous, and effective it should commence on the first day of registration and extend to a student's first position of employment.

During the past thirty years numerous models have been developed to assist administrators and faculty members evaluate programmes offered by the institutions they serve. One of the earliest evaluation models employed in education, according to MacKay and Maguire,[50] was developed by Tyler, who compared observed behaviour with well defined objectives. Evaluation was considered by Tyler to be an integral part of the educational process, as shown by the following statement in Appraising and Recording Student Progress:

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[49] Ralph W. Tyler. "General Statement of Evaluation". in Readings in Educational and Pshchological Measurement edited by C. I. Chase and H. G. Lindlow. (Boston: Houghton Mifflin Company, 1966), pp. 19-20.

[50] D. A. MacKay and T. O. Maguire, Evaluation of Instructional Programs (Edmonton: Human Resources Research Council, 1971), p. 27.

> The process of evaluation should . . . not be thought of as simply the giving of a few ready made tests and the tabulations of resulting scores. It . . . should be a recurring process involving the formulation of objectives, their clearer definition, plan to study student's reactions in the light of these objectives.[51]

Though Tyler's work was a major advance in evaluation MacKay and Maguire note that the "strictest application of the Tyler model had some difficulties".[52] Defining objectives in behaviour terms, for instance, is not always an easy or feasible task to accomplish.

Dissatisfaction with the traditional approach of evaluating programmes with achievement tests, prompted Cronbach in 1963 to propose that:

> The outcomes observed should include general outcomes ranging far beyond the content of the curriculum, its self-attitudes, career choices, general understanding and intellectual powers, and aptitude for further learning in the field.[53]

This approach directs the focus of evaluation away from the mastery of specialized skills to the general educational development of a student. Cronbach further suggested that evaluation should examine the processes by which outcomes are achieved, since they identify what happens during instruction. The evaluation model proposed by Cronbach includes:

1. Process studies
2. Proficiency measures
3. Attitude measures
4. Follow-up studies

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[51] E. R. Smith and R. W. Tyler, Appraising and Recording Student Progress (New York: Harper and Row, 1942), p. 27.

[52] MacKay and Maguire, Evaluation of Instructional Programs, p. 6.

[53] L. J. Cronbach, "Course Improvement Through Evaluation", Teachers College Record, Vol. 64, No. 7 (April , 1963), p. 683.

According to several writers this comprehensive approach to programme evaluation has yet to be put into practice.

An evaluation model that provided administrators and educators with a framework,which enable them to examine practical issues,was developed by Stake, in 1967. He proposed that in order to evaluate a programme, an educator must gather antecedent, transaction,and outcome data, based on judgemental statements and description. [54] Once the data had been classified according to this format, the descriptive data were processed by "finding the contingencies among antecedents, transactions, and outcomes and finding the congruence between intents and observations".[55] The data recorded in the judgemental dimension,however,were processed "with respect to absolute standards as reflected by personal judgements and . . . to relative standards as relected by characteristics of alternative programmes". [56] If evaluation was to be effective and worthwhile,Stake emphasized that educators had to be more detailed and formal in the manner in which they undertook this task.

In the late sixties, Stufflebeam developed a systems model for evaluating programmes that consisted of four stages, namely, content evaluation, input evaluation, process evaluation, and product evaluation. This system was designed to generate date that would make administrators more effective decision-makers. This group of educators viewed evaluation as, "the process of delineating, obtaining, and processing information for judging decision alternatives".[57] During each of the stages, the four processes were completed by collecting, organizing, analyzing, and reporting data, which were then assessed in terms of their validity, reliability, timeliness, pervasiveness, and credibility.

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[54] R.E. Stake, "The Countenance of Educational Evaluation", Teachers College Record, Vol. 68 (1967), p. 528.

[55] Ibid., p. 532

[56] Ibid., p. 536

The objective of the first stage, content evaluation, was to identify and assess needs existing in the environment and to delineate the major issues constituting such needs, thereby identifying the goals or programme should be achieving. Once the objectives of a programme had been defined, Stufflebeam's second stage, input evaluation, was commenced, which assessed the strategies and resources available for attaining these objectives. The third stage, process evaluation, provided 'feedback' as to the success of the strategies adopted, which identified modifications in procedures that needed to be undertaken. The final stage, product evaluation, determined the effectiveness of the process and assessed the extent of a programme's objectives had been achieved.

Recently Clarke et al,[58] at the University of Alberta, developed a systems model for evaluating programmes offered by community colleges. This model was designed to gather data on students from the time they first entered college to their first job in the labour market. At any phase during a student's flow through a college, there was provision in this model for conducting Stufflebeam's four stages of evaluation at three functional subsystem levels and in two modes of evaluation. Using the synthetic model, designed by Clarke et al, community colleges can conduct evaluation studies which may vary, fairly considerably, in terms of their nature, scope and complexity. Furthermore, this model provides colleges with 'feedback' from former students regarding the value of the education they received in their present positions of employment. Clarke et al reported that:

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[57] Daniel Stufflebeam, et al., Educational Evaluation and Decision Making (Itasca: F. E. Peacock Publishers, Inc., 1971), p.40

[58] Clarke, et al., A Systems Approach to Follow-up Studies in Community Colleges, pp. 17-28.

> An examination of the titles of research projects undertaken in Western Canadian College systems . . . confirms that although many planning projects have been undertaken, virtually no studies have reported the results of large-scale follow-up evaluations in colleges.

According to the literature reviewed, most evaluation studies are 'one-shot' affairs, which assess a programme at a specific point in time. No consideration is usually given to the outcomes of the programme either before or after the enquiry. If evaluation is to be a continuous process, as recommended by many writers, then it must be extended beyond the physical boundaries of an institution. Since the criteria for assessing the effectiveness of training programmes are often founded on external factors, follow-up studies should be an integral part of evaluation.

VI COMMUNITY COLLEGE FOLLOW-UP STUDIES

Community colleges, in the United States, for the past fifty years have been conducting follow-up studies to discover whether former students secured occupations for which they had been trained, to obtain graduates' evaluations of programmes, and to secure recommendations for improving learning experiences. Until recently, very few investigations

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[59] Ibid. p., 1.

of this type were undertaken by Canadian Community Colleges. This situation, according to Collin, was partly due to the fact that in the United States "colleges have existed for a greater length of time and enrollments have been and are generally higher".[60]

After reviewing numerous studies completed in the United States, the investigator believes that the scarcity of research in Canada on former community college students is, to some extent, due to the favourable financial position enjoyed by most colleges, the failure of colleges to establish research departments and a reluctance to support follow-up studies.

A large number of investigations on former community college students, completed in the United States, were concerned with graduates who transferred from a junior-college to a university or four year institution. The focus of these research studies illustrates the emphasis placed on transfer programmes by community colleges when they initially commenced operation. Though the goals of community colleges have broadened over the last twenty-five years and a wider selection of vocational programmes is available in most institutions, Monroe notes that "the competition from other offerings and programmes has not reduced the transfer programme to second place".[61] Furthermore he reports that studies of the attitudes of both faculty and students have revealed "that the transfer courses hold a favourable position over other courses in the majority of cases".[62] Due to this preference for academically oriented programmes it is not surprising, as Thornton points out that:

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[60] W. J. Collin, "A Follow-Up Study of the 1966-70 Graduates of The Alberta Agricultural and Vocational Colleges," Unpublished M.Ed. Thesis. (Edmonton: Department of Educational Administration, University of Alberta, 1971), p. 18.

[61] Monroe, Profile of the Community College, p. 60.

[62] Ibid.

> . . . few studies are reported of the success of vocational trained graduates in finding employment in the area of their training and of their comparative success after placement. [63]

Though some community colleges in Western Canada similarly assign a high priority on university transfer programmes, many other institutions place equal emphasis on both vocational and academic course offerings. The follow-up studies completed in the United States, due to their biased nature, were considered to be of limited value in the Canadian setting. Since the number of students enrolling in the vocational programmes, offered by community colleges, is increasing at a rapid rate, more research must be undertaken to study the success of graduates from vocational programmes.

According to O'Connor community colleges have been reluctant to undertake follow-up studies of vocational programmes, because they tend to be more difficult to satisfactorily conduct due to the fact that:

> 1. Technical-occupational students quickly disperse and consequently . . . are difficult to find.
>
> 2. Because of the dispersion of students, greater reliance must be put on the questionnaire as a source of information.
>
> 3. Standards of acceptable performance vary widely in business and industry.
>
> 4. Responses from occupational students, especially when the questionnaire is the only means to reach them, is frequently low. [64]

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[63] Thornton, The Community Junior College, p. 266.

[64] Thomas J. O'Connor, Follow-Up Studies in Junior Colleges: A Tool for Institutional Improvement (Washington D. C.: American Association of Junior Colleges, 1965), p. 38.

Many of these problems can, however, be resolved by developing an appropriate research design, informing students before leaving college that they will be receiving an evaluation questionnaire after graduation, emphasizing the purpose of the follow-up study and stressing the importance of their participation.

The low response that characterizes many follow-up studies appears, to some extent, in the opinion of the investigator, to be the consequence of insufficient perparation prior to conducting an investigation. Orr and Neyman in their review of the design, execution, returns, and costs of the follow-up study of high school students, as part of Project Talent, [65] reported that a statement emphasizing the purpose of the study and their necessary involvement was read to students prior to their leaving school, which was hoped would motivate them to return the questionnaire they would later be mailed.[66] Also each student was asked to provide a permanent address to which the follow-up questionnaire could be mailed, since it was recognized that in many instances, students would change their residence after graduation. Furthermore, it was acknowledged that whether a student were contacted once he had changed residence depended upon the parent or recipient at the permanent address forwarding the questionnaire to him, a task which the individuals concerned could be encouraged to perform by a short telephone conversation.[67]

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[65] J. C. Flanagan et al, The Talents of American Youth: Design for a Study of American Youth Vol. I (Boston: Houghton Mifflin, 1962).

[66] Thomas J. O'Connor, Follow-Up Studies in Junior Colleges: A Tool for Institutional Improvement (Washington D. C.: American Association of Junior Colleges, 1965), p. 38.

[67] *Ibid.*, p. 374.

The literature review also revealed that research on dropouts from community colleges was extremely scarce and in Canada, virtually non-existent, compared with the numerous investigations that have been undertaken during the last two decades to discover why high school students discontinue their studies. One of the few studies on dropouts from community colleges completed in Canada was undertaken by Dennison and Jones in British Columbia. The purpose of this study was to determine the characteristics of dropouts from Vancouver City College (Langara Campus) and discover the major reasons for withdrawal. Based on the data gathered, Dennison and Jones reported that "financial problems and inadequate motivation were cited as reasons for attrition by the largest number of students".[68] There was no indication from dropouts' responses that academic problems were a major cause of attrition. However Dennison and Jones noted that these studies had indicated:

> . . . if the college programme is to be improved as a result of constant evaluation of such a programme, the evaluation should be based on complete and accurate data.[69]

In 1969, Dennison and Jones conducted a follow-up study of career students who had graduated from Vancouver City College (Langara Campus), which was one of the few investigations of this type completed in Western Canada during the sixties. After critically appraising the data generated by the investigation, Dennison and Jones concluded that if the dropout rate was to be lowered and students achieve a higher level of performance in career programmes, Vancouver City College should seriously consider adopting a 'modified open-door policy'.[70] Furthermore, they maintained that public relations between the College and employers needed to be improved and procedures developed that would enable career students to transfer to either the British Columbia Institute of Technology or one of the Provincial Universities.

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[68] John D. Dennison and Gordon Jones, A Study of the Characteristics of Students Who Withdrew from Vancouver City College During the 1969-70 Academic Year (Vancouver: Langara Campus, Vancouver City College, 1971), p. 89.

[69] Ibid., p. 8.

At the University of Alberta, three follow-up studies were completed by graduate students in the Department of Educational Administration between 1971-73. The first study was conducted by Collin who examined the extent that Agricultural and Vocational Colleges of Olds, Vermillion and Fairview were meeting the needs of students and serving the functions for which they were designed. The 804 questionnaires completed and returned by former students revealed that;

1. The major purpose the students had for attending an Agricultural and Vocational College was job preparation.
2. Nearly 80 percent of the graduates obtained employment immediately following graduation.
3. Over 65 percent of all graduates perceived their first job as being "considerably" and "very much" related to the program taken at College.
4. Almost 50 percent of the graduates from agricultural programmes returned to the farm for their life's work.
5. The majority of the graduates perceived the various aspects of the operation, programmes, and facilities at the College as very good and excellent.
6. More than 80 percent of the graduates rated their overall experience at the College as good to excellent.[71]

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[70] John D. Dennison and Gordon Jones, One Year After College (Vancouver: Langara Campus, Vancouver City College, 1969), pp. 60-61.

[71] Collin, "A Follow-Up Study of the 1966-70 Graduates of the Alberta Agricultural and Vocational Colleges", pp. iii-iv.

This evidence appears to indicate that the three colleges were achieving their objectives and adequately meeting the needs of the students served.

A more comprehensive investigation was undertaken by Ottley and Ramer, who completed follow-up studies of students, who graduated from the Gas Technology programme offered by the Northern Alberta Institute of Technology between 1965-71. As noted previously, Ottley obtained the assessment of former students' supervisors as to the extent the programme prepared them for their present employment,[72] while Ramer examined the post-graduation employment activities of students and obtained their assessment of how well the programme prepared them for employment in the labour market.[73] Based on the data gathered, Ramer reported that:

> Graduates generally viewed themselves as better qualified for their first jobs than other new employees having equal experience but lacking their technical training. In their opinion this resulted in them getting better first jobs, needing less on the job training, and having better promotional opportunities in their jobs than other employees lacking their technical training.[74]

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[72] Horace E. R. Ottley, "A Follow-Up Study of Gas Technology Graduates (1965-71) and Their Supervisors". Unpublished M.Ed. Thesis (Edmonton: Department of Educational Administration, University of Alberta, 1974), p. 6.

[73] J. Robert Ramer, "A Follow-Up Study of Gas Technology Graduates from 1965 through 1971, "Unpublished M.Ed. Thesis. (Edmonton: Department of Educational Administration, University of Alberta, 1974), p. 6.

[74] Ibid., p. 126.

Both Ottley's and Ramer's investigations differed from most follow-up studies reviewed by the investigator in that the information collected was statistically analyzed.

It is now apparent that if the evaluation of community college programmes are to be of value and assistance to administrators, information concerning vocational programmes must be gathered from dropouts and employers as well as graduates and faculty members. Data of this type, according to O'Connor,"will enable the college to better serve its students . . . and the needs of business and industry".[75] The effectiveness of changes in procedure, impact of modifications in policy,and the appropriateness of decisions depends,to a significant extent,upon the quality of data upon which they are based.

The literature reviewed on follow-up studies supported a recommendation proposed by Clarke et al that such investigations should become an integral part of a community college's evaluation programme. However,the investigator was unable to find a study that was in fact the final phase of an evaluation process. In most instances, a follow-up study was a separate entity from the normal evaluation occurring in a college. The findings of such an investigation were usually never compared with the expectations, satisfaction, motivation,or achievement of students while they attended college. The scarcity of basic data on students, during all phases of new college education, identified there was a pressing need for a simple but effective community college programme information system.

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[75] Thomas J. O'Connor, Follow-Up Studies in Junior Colleges: A Tool for Institutional Improvement, p. 51, 53.

VII EXISTING PROGRAMME INFORMATION SYSTEMS

Demands for accountability, spiralling costs, high attrition rates, a great variety of educational programmes, and a recognition of individual differences, has compelled community colleges to devote more attention than ever in the past to studying the effectiveness of the programmes they offer, the characteristics of the clientele they serve, and whether institutional goals are being attained. These social pressures and self appraisal activities, as noted previously, have revealed that most post-secondary educational institutions do not possess adequate data to satisfactorily appraise their activities or improve decision-making.

According to Goettel and Berke, this lack of appropriate data at all levels of education may be traced to two major sources, "firstly, and most important, data are not organized in ways that would facilitate policy formulation; second, data are scattered among a variety of agencies".[76] Assuming these perceptions are accurate, they suggest that existing information systems are failing to generate the data educators need to cope effectively with the issues confronting them. Also, Goettel and Berke report that one of the most discouraging aspects of this situation "is that the inadequacy of the data available to educators has been noted by numerous individuals and study committees over the past 30 to 40 years".[77] Obviously the generators of data have not kept pace with the changes occurring in education.

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[76] Robert J. Goettel and Joel S. Berke, Improving Information Systems for Educational Policy Making (Syracuse: Syracuse Research Corporation, 1971), p. 7.

[77] Ibid., p. 107.

The literature reviewed indicates that one of the major weaknesses of existing information systems was that the designers had not given sufficient thought and consideration to the type of data which should be gathered or how the data once collected would be used. The generation of inappropriate data, in addition to wasting valuable resources, has often created a number of complex problems, emphasizing the need for data generated by an information system to be timely, reliable, and relevant. The primary purpose of an information system, as Tiedeman et al note, "is to bring about clearer understandings of situations, issues, and problems".[78] It is important that this feature of a system is not forgotten in the design process. In an effort to eliminate the inadequacies of existing information systems, numerous studies have been undertaken and experimental systems pilot-tested. In 1968, the Missouri Commission on Higher Education[79] sponsored a study to design an information system for post-secondary institutions in the State of Missouri, which was typical of many state wide projects reported in the literature. The investigators adopted a total systems approach so as to develop as comprehensive a data bank as conditions permitted. In order to accomplish this task, the system was considered to be comprised of five subsystems, namely:

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[78] David V. Tiedeman et al., An Information System for Vocational Decisions (Cambridge: Harvard University, Graduate School of Education, 1970), p.6.

[79] Missouri Commission on Higher Education, Specifications for a Higher Education Information System (Chicago: Cresap, McCormick and Paget, 1968).

1. Student information,
2. Programme information,
3. Financial information,
4. Personnel information, and
5. Facilities information.

However, it was reported that the students' information system was the most important information source of the five components because, "the data collected from this subsystem is [sic] used in the other four".[80] Though the system was only an experimental project, the investigators reported that it yielded valuable input, process, and output data for decision-making.

At Ohio State University, the Centre for Vocational and Technical Education, in 1970, developed an evaluation system for assessing the effectiveness of vocational programmes that employed a minimum of data. According to Starr and Dieffenderfer, "data requirements were derived systematically from evaluation purposes, programme objectives, and goal statements,"[81] which prevented irrelevant data being gathered and enabled the investigators to assess, at minimum cost, the extent to which programmes were achieving their prescribed goals. Furthermore, with utilizing a minimum amount of data, it was possible to evaluate vocational programmes on a continuous basis. This task would have been more difficult to achieve if the data set had been larger.

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[80] Ibid., p. 1-1.

[81] Harold Starr and Richard A. Dieffenderfer, A System for State Evaluation of Vocational Education (Columbus: The Centre for Vocational and Technical Education, Ohio State University, 1972), p. 22.

When developing a programme information system,it has to be remembered that all the information gathered will not be used by everyone in an organization. Usually, as noted by Busbee, "with movement upward through the network organization, less detailed information is needed".[82] Therefore,the information needs of various educators has to be given due consideration in order to prevent unnecessary duplication of data, to reduce confusion, and to facilitate more effective decision-making. Though developing a programme information system can be expensive in terms of time, personnel,and financial resources, the literature reviewed indicated that the costs involved are small compared to the long-run benefits which providing educators with high quality data yields.

VII SIGNIFICANCE OF THE LITERATURE REVIEWED

According to the literature,community colleges are comprehensive educational institutions designed to satisfy the post-secondary educational needs of as many citizens in a community as possible. By providing academic, vocational,and general education programmes,these institutions are playing a vital role in sustaining the nation's present rate of economic growth, maintaining a low level of unemployment, and assisting young adults to cope with the demands of a dynamic technological society. By supporting a philosophy of equal educational opportunity, these colleges have provided anyone capable of benefitting from a college education with the opportunity to do so. However,there was ample evidence, in the literature reviewed, that more information must be gathered on the activities of community colleges if they are to continue effectively to satisfy their major educational goals.

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[82] Cyril B. Busbee, Planning Design for Basic Educational Data Systems (Columbus: South Carolina State Department of Education, 1969), p. 7.

Since community colleges evolved to provide members of society, who in the past had never attended college,with an opportunity to experience a post-secondary education, it is not surprising that the clientele they serve is more heterogeneous than that of any other post-secondary institution. Under these circumstances, as the literature indicated, it is very difficult to describe an average student who attends a community college, though considerable research has been undertaken that focuses on the academic ability, intellectual aptitude,and personality of a typical student. Studies of this kind , as O'Bannion emphasizes, conceals the wide range of abilities possessed by community college students; hence,their findings are questionable.

If the programmes offered by a community college are to adequately satisfy the occupational aspirations, value norms,and intellectual abilities of adults attending community colleges, the literature suggested that more information was needed on the socio-economic characteristics, academic background, career expectations ,and motivation level of such students. Due to the diversity of a college's clientele, several writers proposed that analysis should be focused at a divisional or programme level. Similarly, the literature disclosed that most community colleges possessed virtually no information as to why certain students discontinued their studies, though the rate of attrition was high in many instances. There was a general consensus among investigators that this situation warranted more research and study.

Similar to all educational institutions, community colleges, through the programmes and services they provide, endeavour to attain a variety of goals that direct, shape, and influence the learning experiences to which students are exposed. In the literature, several writers reported that community colleges attempt to achieve multiple goals, which often result in the attainment of one goal leading to the suboptimization of the others. Also, it was noted that most institutional goals were vague and very imprecisely defined which, though unsatisfactory for directing the activities of an institution, provided the necessary flexibility for accommodating the diversity of needs expressed by the clientele and faculty of a college.

In several articles reviewed by the investigator, it was strongly recommended that more research should be undertaken to empirically examine the goals of post-secondary institutions at an operational level. Better quality information on programme goals, according to a number of writers, would assist faculty members to modify curricula, and to indicate the extent to which students' needs were being satisfied, and would enable administrators to justify requests for additional financial resources. The literature surveyed clearly indicated that for community colleges to maintain or improve their effectiveness, more information was required regarding the goals of the programmes.

The evaluation of a programme, according to the literature, was usually only undertaken in response to an external or internal agency questioning its effectiveness. Most colleges, it appeared, did not systematically evaluate the programmes they offered. This shortcoming was due to an inadequate information system, disagreement as to what aspects of a programme should be evaluated, and faculty members' reluctance to become involved in critical appraisals of the learning environment. Under these circumstances, few colleges were adequately informed as to whether the programmes they offered were satisfying the needs of their clientele, attaining certain goals, or effectively utilizing resources. The literature reviewed identified a need for more data on the activities of community colleges.

Though a variety of models had been developed for evaluating programmes, the literature revealed many were difficult to apply. One of the most promising developments in this area, according to a number of writers, has been a systems model developed by Guba and Stufflebeam. Since its initial conception, this model has successfully been applied to examine a variety of educational programmes and has been the base for more complex conceptual frameworks. It was suggested, in a number of articles, that the Guba-Stufflebeam model was one of the most useful and versatile evaluation procedures presently available to community colleges.

According to the literature, most community colleges are unaware of the type of employment secured by former students or whether they were satisfied with the training they received. Information of this kind, as was noted, would be extremely useful for improving curriculum, evaluating programmes, and modifying admission procedures. Similarly, information was scarce regarding the factors causing certain students to withdraw from college, though attrition rates are high in many institutions. Furthermore, the literature disclosed that employers were rarely requested to provide feedback on programme, though colleges are often dependent upon certain companies hiring their graduates.

The literature suggested that many colleges were reluctant to contact either former students or employers because of the numerous difficulties associated with follow-up studies. Also, in many instances, college administrators perceived the data gathered in follow-up studies to be of minimal value due to the low response rates of participants. However, as several writers noted, response rates could be raised by developing an appropriate research design, adequately preparing students before graduation, establishing good rapport with participants, and emphasizing the importance of students being involved in the evaluation of programmes. By employing a systems approach to evaluation, such as the Guba-Stufflebeam model, several writers maintained that a follow-up study could be more effectively conducted, since contacting graduates nationally follows analysis of the educational process.

The information systems presently employed by many community colleges, according to the literature reviewed, were inadequate for their information needs. As a result of this situation, administrators generally relied on their own personal experience, values, and judgments in resolving the increasing number of problems with which they were being confronted. This situation resulted in a waste of valuable resources, taxed the energies of senior administrators, and reduced decision-making to a trial and error process.

Though a variety of information systems was reported available on the market, community colleges in Western Canada were reluctant either to purchase or rent the necessary hardware and software because administrators perceived the systems as being too expensive, complex, and comprehensive for their needs. The literature indicated that community colleges were presently in need of a simple but effective information system which would be integrated into their existing organization at minimal expense and disruption. If an information system were to satisfy adequately the data requirements of an organization's members, a number of writers recommended that high priority be assigned users' needs. Also, it was suggested that provision be made for staff, at the operational level, to voice their opinions.

Based on the findings of this literature search, the investigator concluded there was need for a programme information system capable of generating relevant data which would enable community college administrators and faculty members to adopt a more rational approach to decision-making. The establishment, pilot-testing, and application of a provisional system are the focus of the ramaining chapters of this developmental study.

CHAPTER III

THE CONCEPTUAL BACKGROUND

I SYSTEM ANALYSIS

Although a variety of approaches has been employed to study the activities of educational organizations, educators, in recent years, have been using, more extensively, an analytical technique known as 'systems analysis'. According to Sergiovanni and Carver this approach has appealed to educators because it attempts:

> . . . to carefully define and map each of the independent parts of the whole so that one part can be manipulated with full awareness of the effects on each of the other parts internal to the system and the effects of this system on its environment.[83]

A knowledge of these interrelationships provides some indication of the extent to which specific programme goals have been attained, the effectiveness of various instructional practices, and the impact of new institutional policies. As the anticipated consequences of tighter budgets become a reality, greater emphasis will be placed on obtaining higher returns for each dollar spent on education. Demands of this kind will require senior administrators to adopt a more rational approach to decision-making, policy analysis, and future planning, which a systematic analysis of an educational institution will facilitate.

Basically, there are two types of systems; a closed system that is self contained, and an open system which interacts with the environment.

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[83] Thomas J. Sergiovanni and Fred D. Carver, The New School Executive: A Theory of Administration (New York: Dodd, Mead and Company, 1974), p. 215.

However, in reality, as Immegart and Pilecki point out, "certain properties . . . pertain to all systems, both the 'open' and the 'closed'", [84] which makes it difficult to classify systems into two distinct categories. This dilemma has been overcome by viewing organizations as existing on an open-closed continuum, thereby acknowledging that systems can vary in their degree of openness and closedness.

Based on Parsons' theory that an organization can be considered to consist of technical, managerial and institutional subsystems, Thompson suggests that "the phenomena associated with open and closed system strategies are not randomly distributed through complex organizations, but instead tend to be specialized by location". [85] In order to protect its technical core from external forces, an organization introduces practices and policies that reduce the degree of uncertainty at the technical level. Action of this kind results in the technical subsystem being characterized by a high degree of closedness. At the institutional level, in contrast, an organization is continuously interacting with various systems of its supra system. Since an organization has usually no direct control over other systems with which it must communicate and function, the level of uncertainty is very high, hence, as Thompson correctly perceives, "an open system of logic, permitting the intrusion of variables penetrating the organization from outside, and facing up to uncertainty, seems indispensable". [86]

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[84] Glenn L. Immegart and Francis T. Pilecki, An Introduction to Systems for the Educational Administrator (Mento Park: Addison-Wesley Publishing Company, 1973), p. 31.

[85] Thompson, Organizations in Action, p. 10.

[86] Ibid., p. 12.

An organization also has a certain domain within which it performs its activities - a system space that is defined by boundaries. However, as Kast and Rosenzweig note, these "boundaries are not easily definable and are determined primarily by the functions and activities of the organization".[87] Although the boundaries of an organization may form barriers which restricts interaction between people within an organization and those associated with other systems in the environment, a boundary as Katz and Kahn note, is a "facilitating device for particular types of transactions and activities".[88]

The feedback that is available to an open system, provides data for evaluating its programmes, services, and products. This feedback enables administrators to "adjust future organizational direction and conduct according to past performance".[89] Therefore, adequate feedback is of vital importance to a complex organization, such as an educational system, if it is to attain the goals for which it was formed. If an organization is deviating from its prescribed function in any way, feedback provides information for readjusting the system so it once again operates effectively. It is evident, as Katz and Kahn note, that "the major function of operational feedback is to provide routine control over operations",[90] to enable an administrator to make decisions without unnecessary delay and error.

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[87] Kast and Rosenzweig, Organization and Management: A Systems Approach, p. 12.

[88] Katz and Kahn, The Social Psychology or Organizations, p. 61.

[89] Robert C. Maxson and Walter E. Sistrunk, A Systems Approach to Educational Administration (Dubuque: William Brown and Company Publishers, 1973), p. 28.

[90] Katz and Kahn, The Social Psychology of Organizations, p. 248.

This brief overview of some of the basic dimensions of systems theory indicates that the activities of most educational organizations are complex, highly interrelated,and difficult to define precisely; therefore,any systems model as Armitage, Smith and Alper point out, "will always be a simplification of reality because of . . . the reduction of detail that occurs ".[91] The various systems models that have been constructed should therefore be recognized as abstractions of reality; a limitation that should not be overlooked when proposing recommendations for change.

An educational institution is but one of the many systems that exist within the supra system known as the environment; a situation which can be represented in simple terms by a model, such as that shown in Figure 1, consisting of input, sytem space, boundaries,and output.

In order to survive,it has been shown that a system needs to be able to modify its activities in response to environmental changes, so that the services and products it produces are congruent with the needs of the clientele served. This self-regulation process requires that the organization obtain feedback from the environment. By slightly modifying the simple model under review, feedback and environmental reactions can be accommodated as shown in Figure 2. This system is commonly known as the "Black Box" model since there is no indication of what occurs in the system space.

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[91] Peter Armitage, Cyril Smith, and Paul Alper, Decision Models for Educational Planning (London: Allen Lane, The Penquin Press, 1969), p. 2.

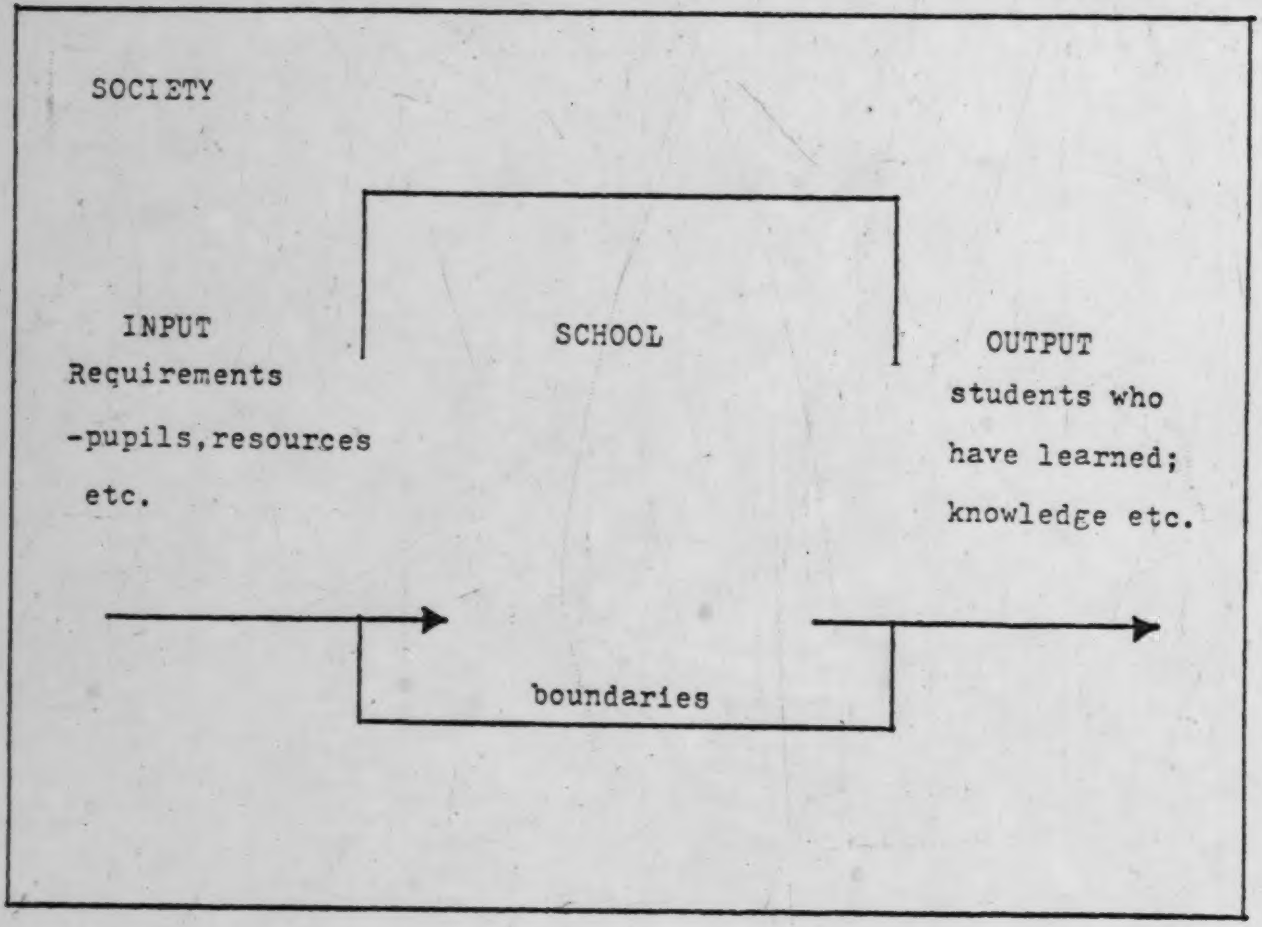
SOCIETY
INPUT
Requirements
-pupils,resources
etc.
SCHOOL
boundaries
OUTPUT
students who
have learned;
knowledge etc.

Figure 1

An Input-Output System

Source: Banathy, Developing a Systems View of Education, p. 12.

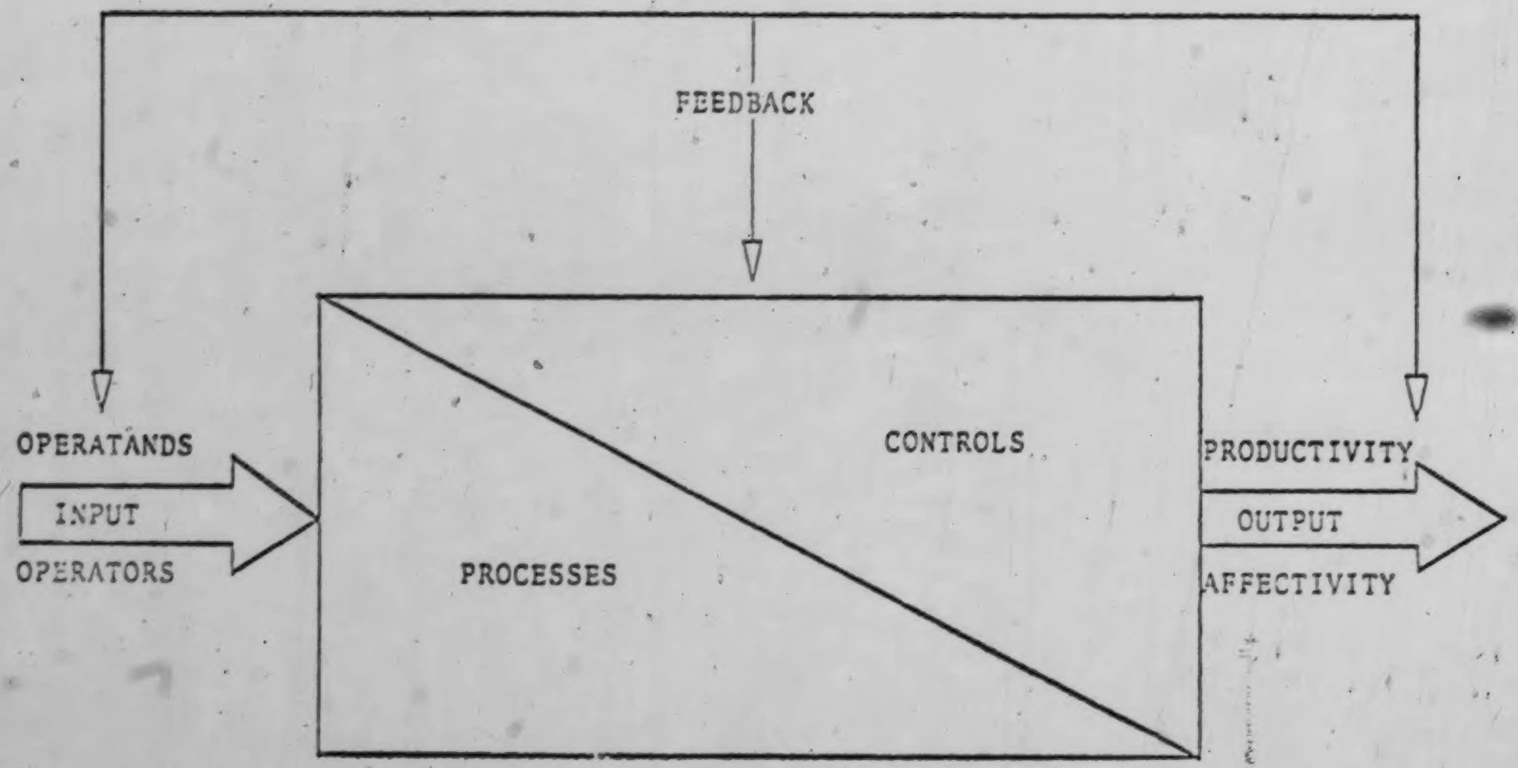
FEEDBACK
OPERATANDS
INPUT
OPERATORS
PROCESSES
CONTROLS
PRODUCTIVITY
OUTPUT
AFFECTIVITY

Figure 2

The Classic "Black Box" Model

Source: Immegart and Pilecki, An Introduction to Systems for the Educational Administrator, p. 15.

A more elaborate system model has been developed by Banathy, who views the activities of an organization, as shown in Figure 3, as consisting of a sequence of operations that "process the system input, act upon the input and transform it into the desired state, process the output, and control and adjust the system".[92] Macro-analysis of this kind,however,obscures the numerous events that must be completed,within the process centres,for the sequence outlined to be concluded. In order to facilitate an adequate study of an organization's operations, a model should be able to describe, in some detail, the processes involved.

At a micro-level, as shown in Figure 4, Banathy proposes that the input process is composed of three distinct phases, namely:

1. Interaction between the system and its environment;
2. Identification of . . . relevant input; and
3. Introduction of . . . relevant input into the system.

These operations provide a description of the clientele served by a system, the goals that are expected to be obtained, the constraints under which the system must operate, the community in which the system is located,and the resources that will be needed for the system to operate. The other process centres as shown in Figures 5, 6, and 7 are similarly considered, in this systems model, to consist of several subunits.

Though more elaborate models than those examined exist, the basic structure of the models studied serves as the foundation for all of them, but,these are differences in detail reflecting the

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[92] Belex A. Banathy, Developing a Systems View of Education (Belmont: Fearson Publishers, 1973), p. 38.

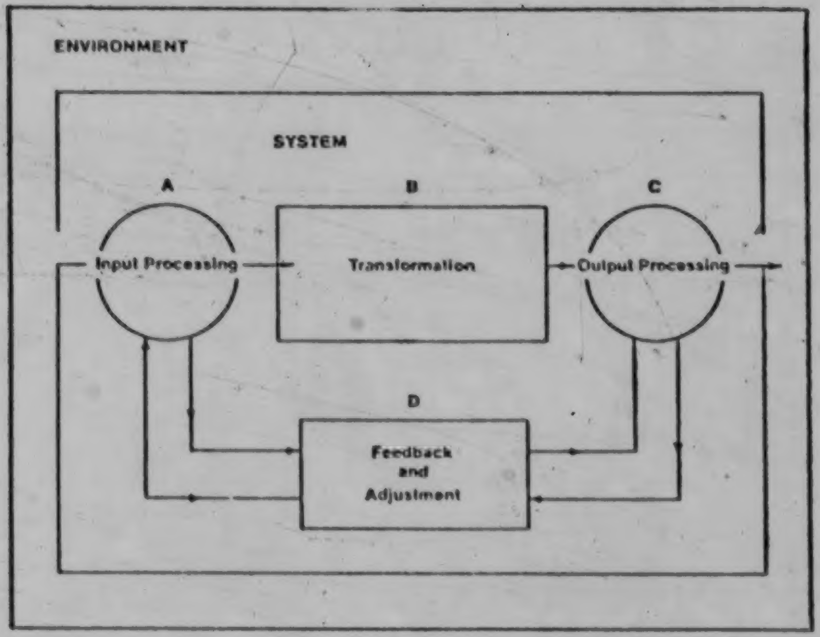
ENVIRONMENT
SYSTEM
A
B
C
Input Processing
Transformation
Output Processing
D
Feedback
and
Adjustment

Figure 3

The Processes of a System

Source: Banathy, Developing a Systems View of Education, p. 37.

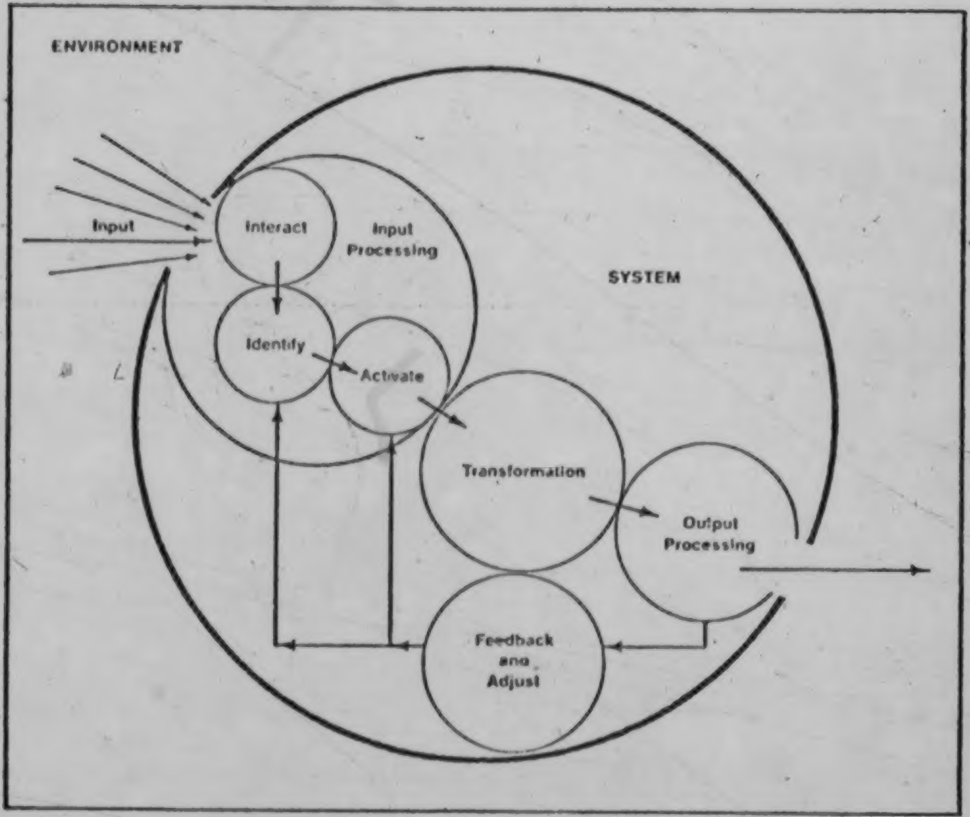
ENVIRONMENT
Input
Interact
Input Processing
SYSTEM
Identify
Activate
Transformation
Output Processing
Feedback and Adjust

Figure 4

The Input Process

Source: Banathy, Developing a Systems View of Education, p. 43.

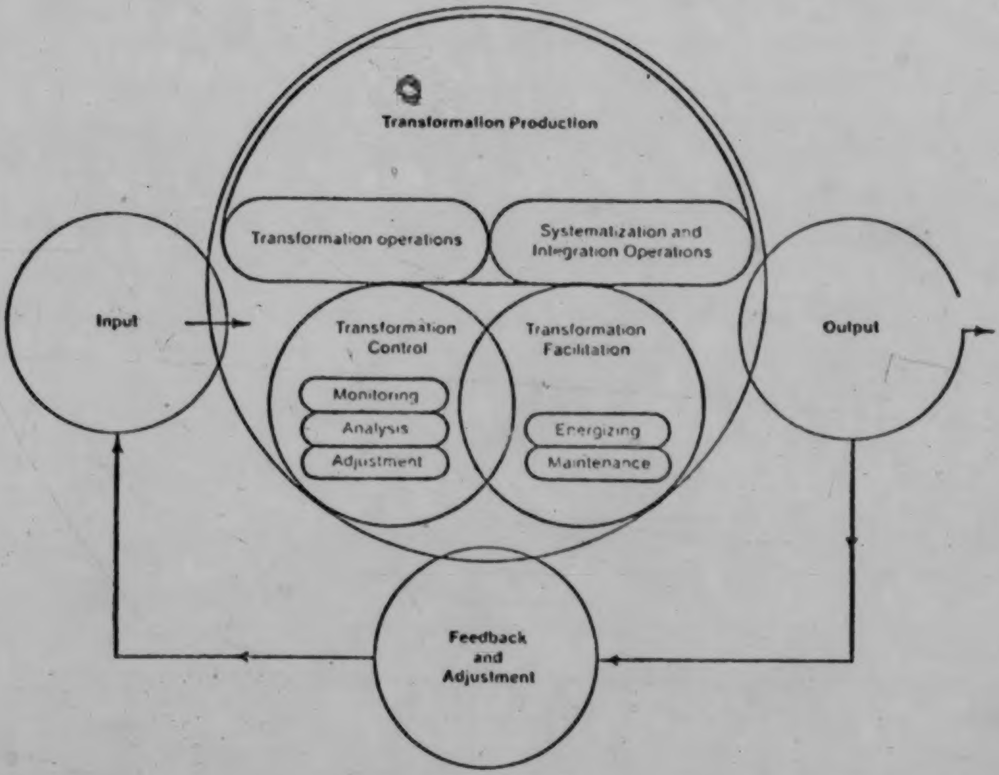
Transformation Production
Transformation operations
Systematization and Integration Operations
Input
Transformation Control
Monitoring
Analysis
Adjustment
Transformation Facilitation
Energizing
Maintenance
Output
Feedback and Adjustment

Figure 5

The Transformation Process

Source: Banathy, Developing a Systems View of Education, p. 49.

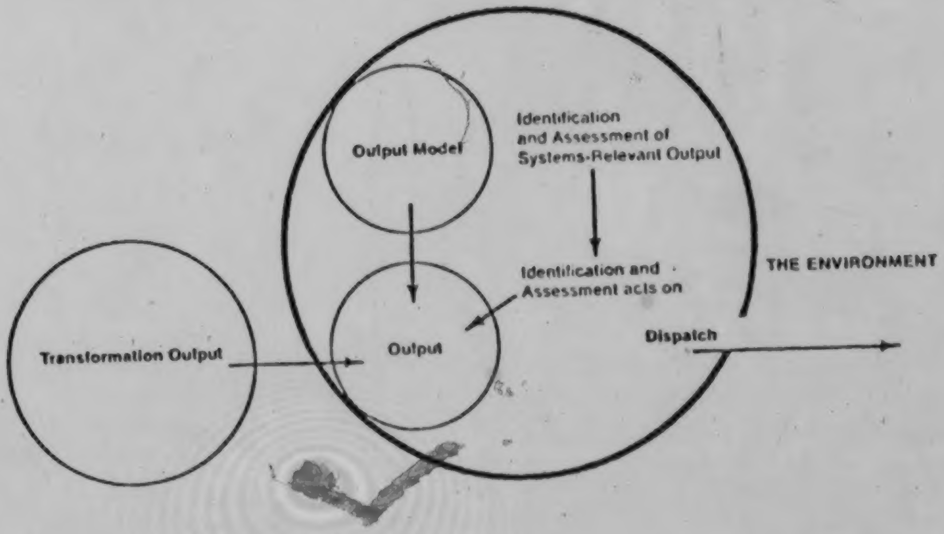
Output Model
Identification
and Assessment of
Systems-Relevant Output
Identification and
Assessment acts on
THE ENVIRONMENT
Transformation Output
Output
Dispatch

Figure 6

The Output Process

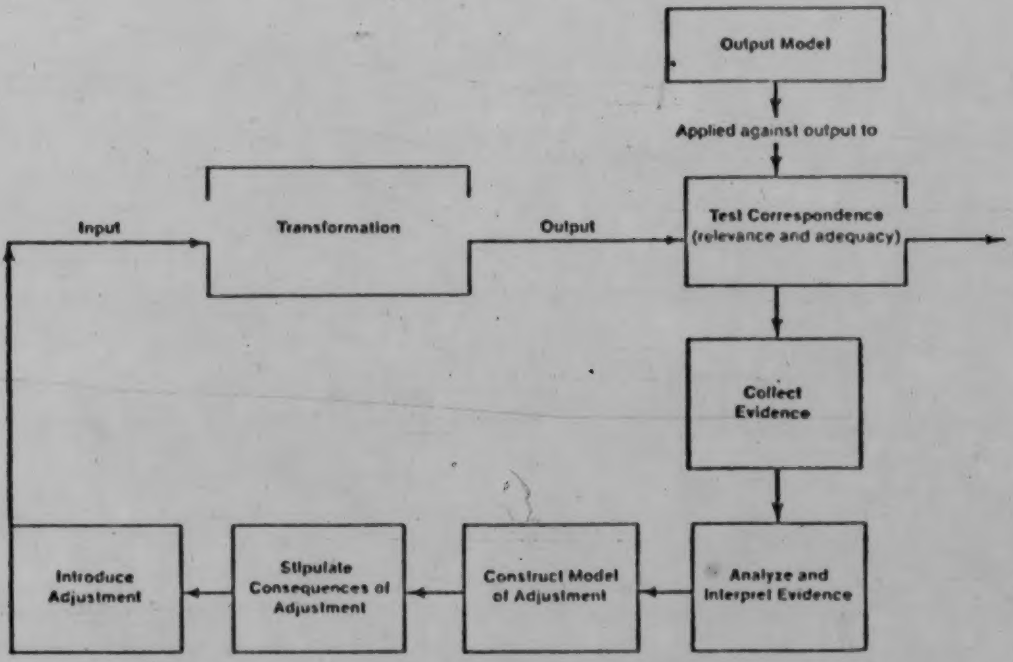
Output Model
Applied against output to
Input
Transformation
Output
Test Correspondence
(relevance and adequacy)
Collect
Evidence
Analyze and
Interpret Evidence
Construct Model
of Adjustment
Stipulate
Consequences of
Adjustment
Introduce
Adjustment

Figure 7

The Feedback Process

Source: Banathy, Developing a Systems View of Education, p. 49, 51.

complexity, uniqueness and specialized functions of the actual system a model represents. As Armitage, Smith and Alper point out:

> The wealth of detail in the educational system is virtually inexhaustible and not only are many different models possible, but the construction of any model involves a deliberate selection of the real features which are considered to be important.[93]

These writers' perceptions emphasize again the importance of remembering, when arriving at conclusions or suggesting recommendations, that any model employed to study the activities of an educational system is only a simplification of reality.

II ORGANIZATIONAL SUBSYSTEM

The various dimensions of a systems approach that have been examined focus on the horizontal interactions occurring within an organization. However, it is important to remember that a vertical hierarchy also exists which in a formal organization, as Kast and Rosenzweig note, "sets the basic communications and authority structure, the so called 'chain of command'."[94] Therefore, the systems approach can be applied to study different hierarchical levels in an organization.

Parsons has suggested that within a formal organization there exists three broad vertical subsystems, namely the 'technical' system, the 'managerial' system and the 'institutional' system, which he considers reflect within any organization:

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[93] Armitage, Smith and Alper, Decision Models for Educational Planning, p. 1.

[94] Kast and Rosenzweig, Organization and Management: A Systems Approach, p. 179.

> . . . references of function or responsibility, which become most clearly marked in terms of the external references of the organization to its setting or to the next higher order in the hierarchy.[95]

Though the subsystems theoretically are considered separate entities, such precise boundaries do not exist in reality; rather, there is an overlapping at the interfaces.

The lowest system in Parsons' model is concerned with the technical activities of an organization, effort, resources, and skills being devoted to producing and to distributing the outputs of the organization. However, as Kast and Rosenzweig suggest, the technical subsystem includes many types of activities other than those directly employed in the production process such as "research and development, production control, market research, operations research, and cost accounting functions".[96]

The next subsystem in the vertical hierarchy, according to Thompson, facilitates the efficient operation of the technical subsystem by:

> 1. Mediating between the technical suborganization and those who use its products.
> 2. Procuring the resources necessary for carrying out the technical function.[97]

Obviously, the function of managerial personnel employed at this level in an organization is to control and integrate the activities of the technical core, implement policies formulated by the institutional system, and ensure the organization complies with regulations established by various public and private agencies. Parsons emphasizes that the ways in which the managerial system fits into the institutional system:

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[95] Talcott Parsons, Structure and Process in Modern Societies (New York: The Free Press, 1960), p. 60.

[96] Kast and Rosenzweig, Organization and Management: A Systems Approach, p. 129.

[97] Thompson, Organizations in Action, p. 11.

> . . . vary widely according to the character of the managerial system's functions and the organization's position on both the 'lateral' and the 'vertical' axes of the larger social system.[98]

This situation is to be expected in view of the large number of complex organizations operating in our dynamic, technological society.

At the institutional level an organization interacts with the subsystem in which it is located. However, since it has no control over this system, a high degree of uncertainty surrounds all communication. However, according to Kast and Rosenzweig the degree of uncertainty can be reduced, to some extent, by "management . . . adopting an open system view and concentrating on adaptive and innovative strategies".[99]

Though the three subsystems are relatively independent, they are also highly interdependent, since as Kast and Rosenzweig point out:

> The institutional level must perform effectively if the organization is to receive the necessary inputs for the technical level. Also, the technical level must produce outputs efficiently to ensure that the organization receives environmental support.[100]

The interaction between and within the three subsystems suggests according to Thompson that:

> Differences in technical functions, or technologies, cause significant differences among organizations, and since the three levels are interdependent, differences in technical functions should also make for differences at managerial and institutional levels of the organization. Similarly, differences in the institutional structures in which organizations are imbedded should make for significant variations among organizations at all three levels.

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[98] Parsons, Structure and Process in Modern Societies, p. 64.

[99] Kast and Rosenzweig, Organization and Management: A Systems Approach, p. 130.

[100] *Ibid*., p. 131.

Hence,Parsons' conceptual framework is able to explain,in precise terms, some of the differences that exist among organizations, which provides educators with a better model of reality than many other theories. Knowledge of an organization's subsystems and the relationships among them facilitates the study of its activities and increases our awareness of the important functions various subsystems perform.

III A SYSTEMS PROGRAMME EVALUATION MODEL

In response to demands for greater accountability educators, recently,have been employing a systems analysis approach, to evaluate educational programmes.This is on the assumption that a satisfactory evaluation can only be conducted if adequate information is available on the various components of a system that influence the products it produces. A systems model that has been used in a number of educational settings to evaluate programmes has been the C I P P (Context, Input, Process, Product) model, developed by a research team at Ohio State University, under the direction of Guba and Stufflebeam. This evaluation model, briefly mentioned in the literature review, was designed to provide educators with data that would enable them to generate more alternatives, than they had in the past, for resolving the problems and issues they encountered; thereby,enhancing their ability as decision-makers.

The four phases of the model have been clearly described by Majer as follows:

> Context
>
> Context evaluation provides information about the environment

in which decision are being made, depicts unmet needs, and identifies problems that may prevent needs from being resolved. In a sense, context evaluation presents an awareness for the need to make a given decision and defines nature of the constraints which surround that decision which must be made. Essentially, it provides the evaluator with a set of guidelines to make planning decisions.

Input

Input evaluation, the second stage of C.I.P.P. uses the information gained in context evaluation to establish working strategies of the agency that will commit action into the situation., More specifically, input evaluation provides decision-making information about how programme goals will met. This may be in the form of generating hypothesis to be implemented or tried out. It may be in the form of developing systematic programme components to work toward specific objectives. And, input evaluation may produce information on cost/benefit analysis to help make a selective decision about programme alternatives.

Process

Process evaluation, the third phase of this mode, deals specifically with questions concerning the implementation of programme strategies. In this sense, process evaluation is very much like the formative evaluation procedures described by Scriven.

These procedures provide information for making decisions about whether programme strategies are being implemented appropriately and about whether certain objectives, goals or strategies need to be modified. The information is provided continually during this stage of programme evaluation and is designed for continuous control and refinement of places and procedures.

Product

The final evaluation activity in the model is product evaluation. Although these activities are continual and not restricted to end-of-programme events, they provide information for making decisions to interpret attainments of the programme. Product evaluation is summative in the sense that it provides information for deciding whether to continue, to recycle, to modify or terminate the activity that is being evaluated.[102]

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[102] Kenneth Majer, "Evaluation: Strategies, Findings, Problems and Suggestions", Viewpoints, Vol. 48, No. 6, (November, 1972), pp. 98-99.

These definitions indicate the precision that can be achieved in evaluation by employing the Guba-Stufflebeam systems approach (see Figure 8).

Based on the work of Stufflebeam and Parsons, a group of graduate students at the University of Alberta, under the direction of Konrad, recently developed a conceptual framework (Figure 9) for evaluating the programmes and services offered by community colleges. After entering college, students are assumed, as shown in Figure 10, to flow through the educational system in a sequence of stages, which as Clarke et al note, could "also be interpreted as a sequence of stages at which various types of data can potentially be generated".[95] Therefore, this model could be employed to gather data systematically on students, from the day they first enter college to their first position in the labour market.

The students flow schema and related information system were integrated by Clarke et al into the CIPP-Institutional Subsystem model, as shown in Figure 11, which provides the administrators and faculty of a college with the choice of undertaking a comprehensive evaluation involving all subsystems, evaluation modes, and evaluation settings; or limiting their investigation to specific dimensions.

In compliance with the systems approach, this model enables feedback to be obtained from students, after they have graduated, and from the employers for whom they work. Information that enables a college to assess, with a fair degree of accuracy, the extent to which the programmes and services it provides are satisfying: (1) the educational needs of its clientele; and (2) certain manpower needs of the local industrial community. As previously noted, demands for accountability, the impact of social changes, and the consequences of inflation, are requiring that continuous evaluation be an integral part of community college activities.

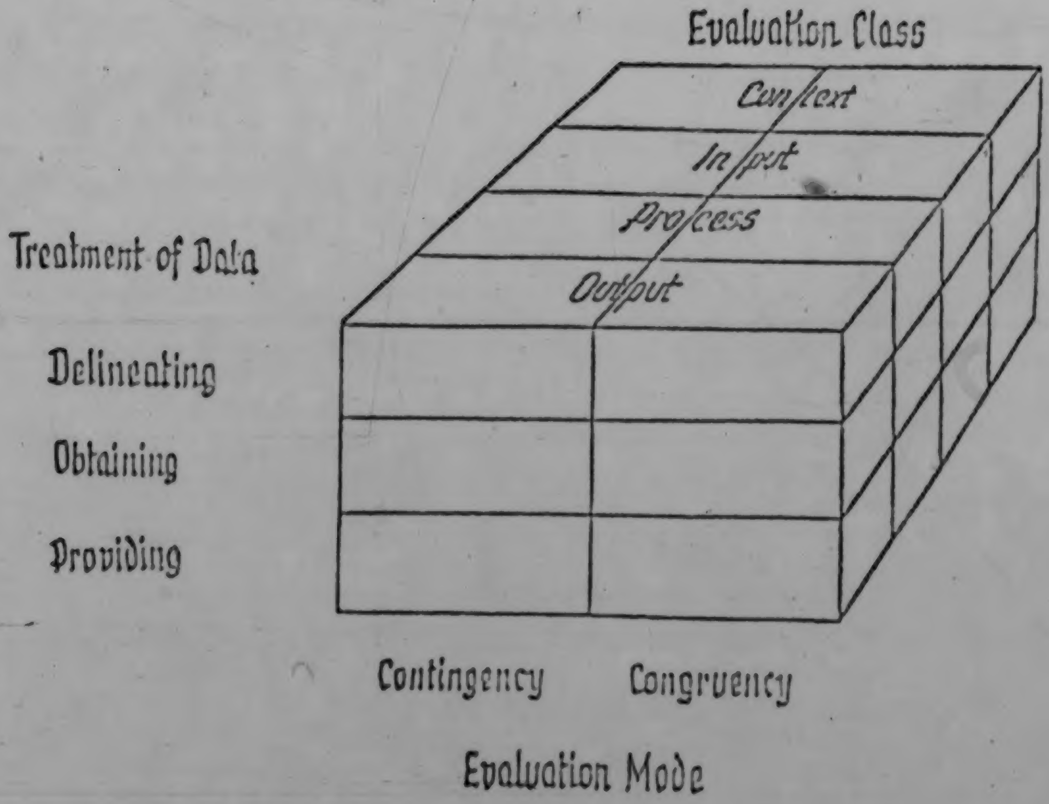

Evaluation Class
Context
Input
Process
Output
Treatment of Data
Delineating
Obtaining
Providing
Contingency
Congruency
Evaluation Mode

Figure 8

The CIPP Model

Source: Clarke, et al., A Systems Approach to Follow-Up Studies in Community Colleges, p. 19-22.

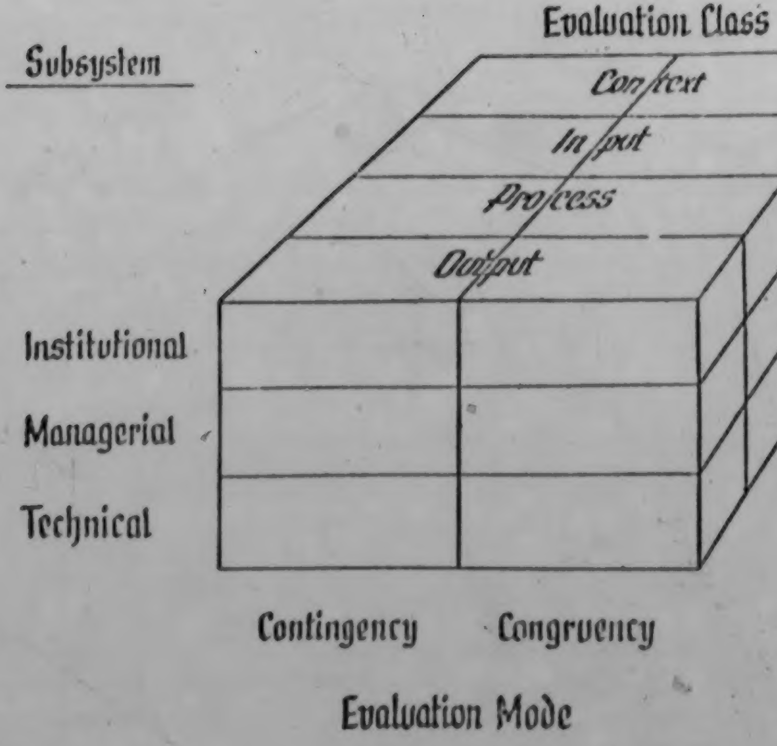
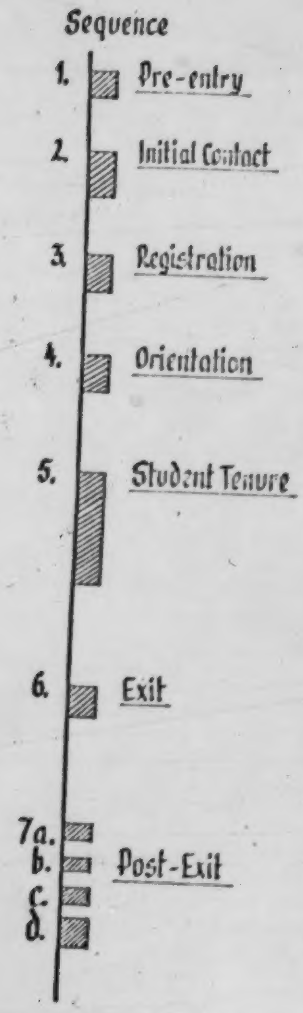

Evaluation Class
Subsystem
Context
Input
Process
Output
Institutional
Managerial
Technical
Contingency
Congruency
Evaluation Mode

Figure 9

The Theoretical Model

Source: Clarke, _et al._, _A Systems Approach to Follow-Up Studies in Community Colleges_, p. 19.



Sequence		
1.	Pre-entry	The time during which potential and future college students are completing high school, are in other post-secondary systems, are in jobs, are unemployed, etc.
2.	Initial Contact	The time when potential students seek information from the college or system about programs or services such that it seems possible that these persons will seek entry
3.	Registration	The point at which students fulfill whatever registration requirements a college sets or will accept with the result that students become enrolled in a program or receive a s service.
4.	Orientation	A particular period of time as defined by the system and considered to comprise "regular" rather than "optional" activities for students; these activities include discussions between students and college personnel.
5.	Student Tenure	A period of time during which the student is offered a set of educational experiences which have been selected or permitted by the college and which usually are termed as a program or a service. Typically, this period commences with registration and continues until the student in some manner prepares to leave the system (graduation, completion, expulsion, dropping out, transfer, etc.)
6.	Exit	A period of time during which the student is involved in a final discussion with college personnel re his program, future aspirations and plans, his "success" or lack thereof, and his assessments of various aspects of his program and tenure in the system.
7a. b. c. d.	Post-Exit	7a through 7d and beyond is a continuous period commencing as the student leaves. This period is arbitrarily marked with some number of points at which the college and student briefly resume discussion as described in #6.

Figure 10

Sequence and Stages in Student Flow Through College

Source: Clarke, et al. A Systems Approach to Follow-Up Studies in Community Colleges, p. 24.

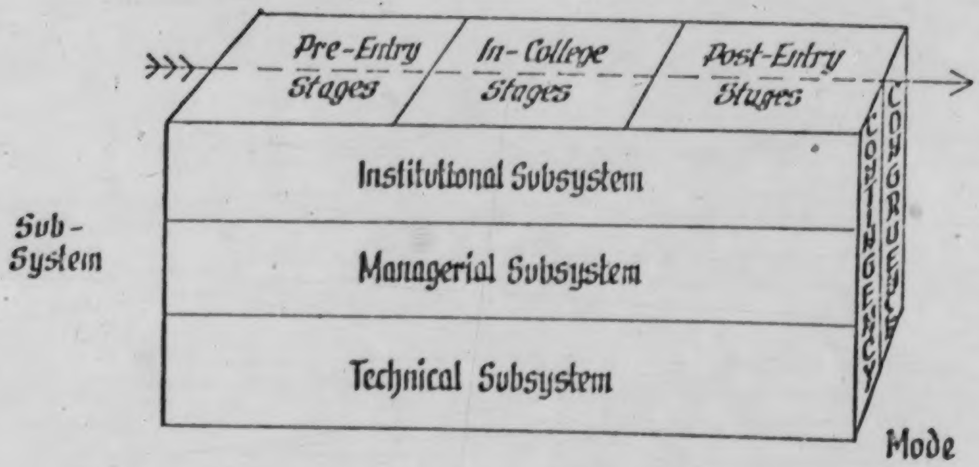

Pre-Entry Stages
In-College Stages
Post-Entry Stages
Institutional Subsystem
Managerial Subsystem
Technical Subsystem
Sub-System
CONTINGENCY
CONGRUENCE
Mode

Figure 11

The Synthetic Model

Source: Clarke, et al., A Systems Approach to Follow-Up Studies in Community Colleges, p. 28.

IV DEVELOPING AN INFORMATION SYSTEM

In order to improve the quality of information available to administrators, faculty members, and support staff, many post-secondary educational institutions are beginning to employ computer based information systems to generate data concerning students, staff, programmes, and operational activities. If these information systems are to assist educators to become more effective decision-makers, then, as Ingram suggests, the systems must generate data that will satisfy the following information needs of an educator.

1. They need to know the policies, rules and guidelines set for them by the upper level agency, so that they can identify and select their own goals on the basis of these policies and guidelines.
2. They need performance information on their own programmes so that they can assess their effectiveness in moving towards the goal selected.
3. They need cost information on their own programmes so that they can assess the efficiency of their programmes.
4. They need to know their own human and financial resources so that they can assess their capabilities to undertake various types of programmes.
5. They need demographic, economic and social statistics and forecasts so they can set goals and priorities and establish programmes.
6. They need access to a data bank on alternative programmes so they can assess and select the most promising means of reaching their goals.
7. They need to know the various wants and needs of their clients.[103]

To accomplish these tasks requires fairly complex and sophisticated system, which many institutions have neither staff nor financial resources to operate. Hence, there is a need for a simple, inexpensive but, efficient data generating mechanism that will provide educators with better information than they presently possess.

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[103] E. J. Ingram, "Educational Planning", Education Canada, Vol. 12, No. 3 (September 1972), p. 33.

An information system, according to Hussain, should be developed in a series of stages, as shown in Figure 12, each consisting of numerous activities, namely:

1. Feasibility Study

   This is the examination of possible alternate solutions to the systems development problem and the checking of these solutions for constraints of technology, resources availability and organizational structure.

2. Determining Systems Requirements

   In this stage, the objectives, policies and constraints of the user must be stated completely and in operational terms.

3. Design of the System

   The design is a set of detailed specifications for each component of the system.

4. Testing the Solution

   There are many approaches to testing. The new system could be tested in parallel to the old, or it could be tested by a pilot system on a small scale. Testing could also be done in different stages and at different levels.

5. Project Management

   A systems development with a large number of interrelated activities is organized as a project. To accomplish this, project management techniques are used.[104]

Though the system becomes operational upon the prescribed sequence of events being completed, it is deficient since there is no provision for ensuring that it adequately satisfies the needs of the user. Hussain corrected this situation by including an additional stage in the development process designed to obtain feedback and provide for

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[104] Hussain, Development of Information Systems for Education, p. 181-191.

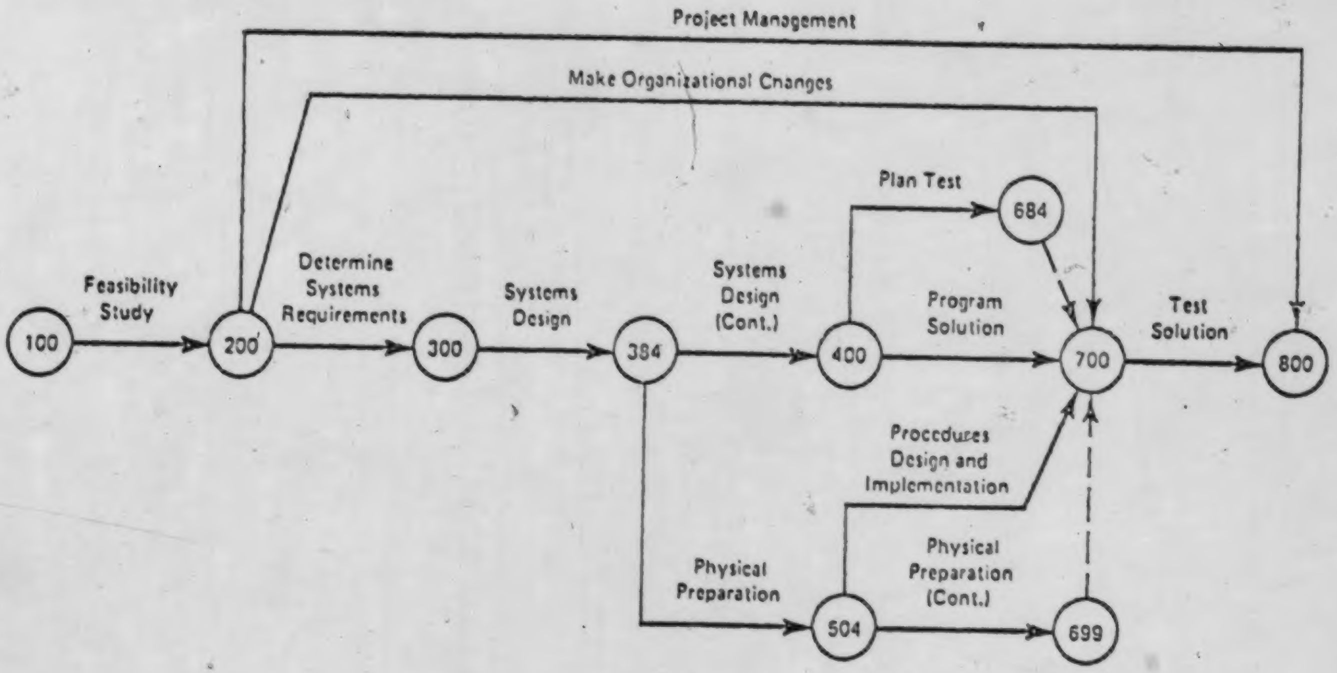
Project Management
Make Organizational Changes
Feasibility Study
Determine Systems Requirements
Systems Design
Systems Design (Cont.)
Plan Test
Program Solution
Test Solution
Procedures Design and Implementation
Physical Preparation
Physical Preparation (Cont.)
100
200
300
384
400
684
700
800
504
699

Figure 12

Network for Developing an Information Process

Source: Hussain, Development of Information Systems for Education, p. 182.

modifications to be undertaken, if necessary.

The initial network employed to describe the order in which events occurred does not provide for alternative courses of action being taken. This is necessary when a feedback stage is incorporated into the system. By using a flow chart,decision points and feedback loops can be included. Consequently Hussain,utilized this technique to outline the development process for an information system (see Figure 13).

Due to the complexity of most organizations, high speed digital computers are now employed to generate the information needed by administrators. In addition,to being able to store large quantities of information for retrievel at a later date, computers process data at a high speed and display output in a form that is easy to read and interpret. Though educational organizations are making greater use of computers to generate information for administrators, data processing is still not used extensively in education as in business. According to Banghart, "the real breakthrough, the use of computers as part of the total information system, has not yet come in the field of education". [105] However, as social, economic,and political pressures presently being exerted on post-secondary educational institutions increase, the scarcity of adequate data for decision-making will become more apparent and acute.

As conditions worsen, it will become more apparent that the information systems employed in many institutions are unable to provide the information needed by administrators and faculty members. Many

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[105] Frank W. Banghart, Educational Systems Analysis (London: The MacMillan Company, Collier MacMillan Limited, 1969), p. 81.

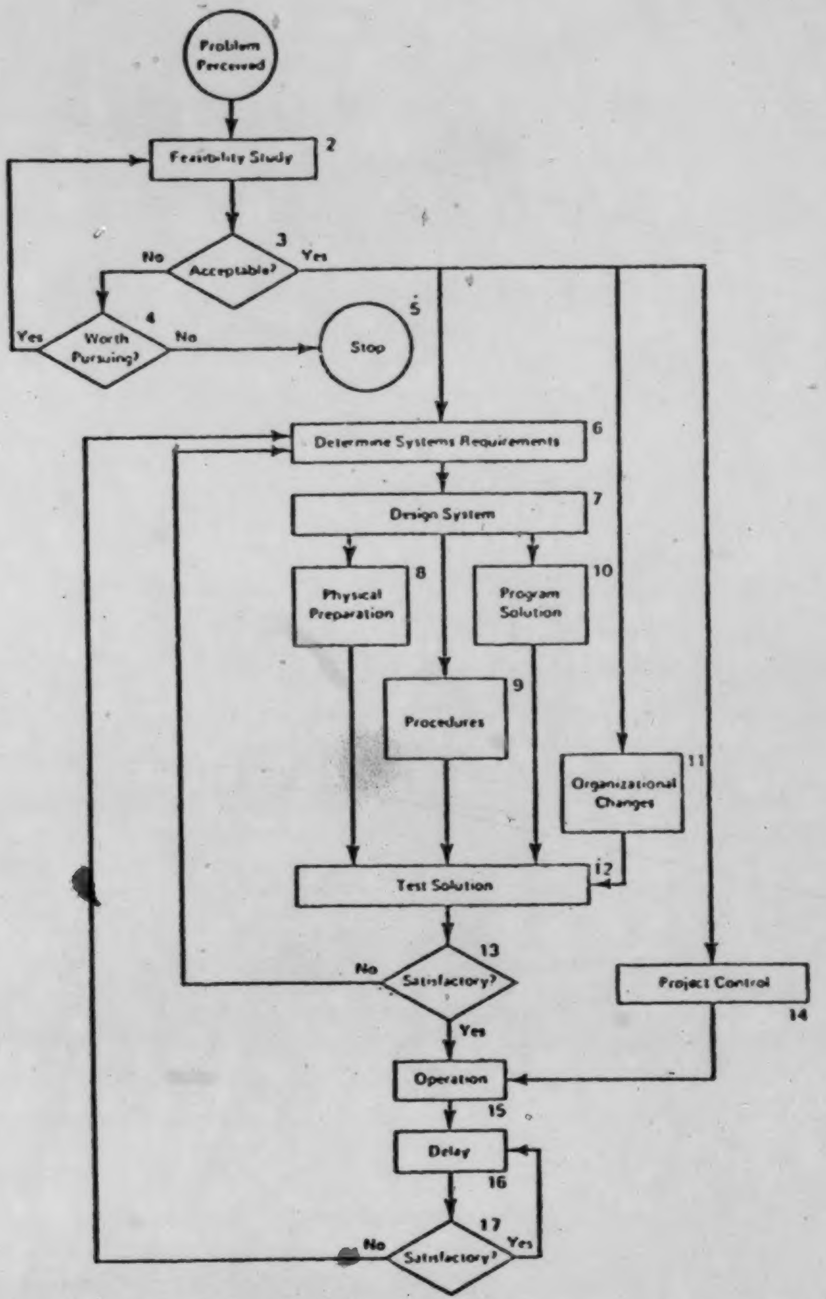
Problem Perceived
Feasibility Study
2
Acceptable?
3
No
Yes
Worth Pursuing?
4
Yes
No
Stop
5
Determine Systems Requirements
6
Design System
7
Physical Preparation
8
Program Solution
10
Procedures
9
Organizational Changes
11
Test Solution
12
No
Satisfactory?
13
Yes
Project Control
14
Operation
15
Delay
16
17
No
Satisfactory?
Yes

Figure 13

Flowchart of System Development and Redevelopment Process

Source: Hussain, Development of Information Systems for Education, p. 186.

institutions will respond to this situation by devoting a greater proportion of their assets, resources,and personnel to improving their existing system. The programme information system developed in this study, offers small community colleges an inexpensive but effective means of generating useful data for resolving a variety of institutional issues,and coping with demands for greater accountability.

CHAPTER IV

THE METHODOLOGY

I A REVIEW OF THE PURPOSE

The literature revealed that community colleges have democratized post-secondary education in Western Canada by offering a wide range of programmes, often with a strong vocational orientation, at a low cost, within a short commuting distance of their client's homes. Furthermore, an 'open-door' policy of admission has reduced entrance barriers that exist in many other post-secondary institutions. Consequently, adults who never graduated from high school, are offered an opportunity to continue their education, if they are able to show they possess the necessary basic educational skills needed to comprehend the material presented in class. The appeal and success of the community college movement is reflected by the rapid growth of such institutions and the increasing number of students who enroll in the programmes they offer.

Due to their popularity, community colleges have not experienced demands for greater accountability, insufficient financial support, or student dissatisfaction with programmes. However, as inflation has gained momentum, community colleges have also become subjected to increasing pressures for more information regarding the efficiency of operations, effectiveness of programmes, and utilization of resources. These requests have revealed an acute shortage of relevant data on the activities of community colleges and identified the inadequacy of the information systems employed by most institutions. Under these conditions, policy analysis, planning, and day to day decision-making have mainly been based on experience, educational guesses, and personal judgment, rather than systematically generated, high quality data. Education is characterized by the practices of 'muddling through', which, in many instances, has resulted in a wastage of physical capital, personnel, and financial resources. Such errors in judgment, during a period of rapid inflation, can have very adverse effects on the quality of education offered by an institution.

The primary purpose of this investigation was to improve this situation by developing a simple, programme information system that could be introduced and employed, at a minimal cost, in any small community college in Western Canada. The instruments, procedures, and models utilized, were designed so that administrators and faculty members could modify them to serve their specific data needs, as well as providing former students, and employers with an opportunity to evaluate the programmes offered by a college and make suggestions for improving the learning experiences of students. A secondary purpose was to indicate how the data, generated by the system, could be effectively utilized.

II OBJECTIVES OF THE STUDY

In order to develop the proposed programme information system, and to indicate how the data it generated might be applied, attention was focused on satisfying six primary objectives. Due to the complexity of the problem the investigator restated each of these primary objectives in the forming of more specific objectives:

Objective 1.0: To establish whether a programme information system would be beneficial to the staff of a community college.

1.1 To investigate some of the problems existing in community colleges.

1.2 To identify information the faculty of a community college need to function more effectively.

1.3 To assess the feasibility of developing and implementing the programme information system.

1.4 To establish rapport with participants and arrange for conducting the investigation.

Objective 2.0: To determine the users requirements of the Programme information system.

2.1 To determine the faculty's information requirements and identify potential constraints.

Objective 3.0: To design a simple, flexible and inexpensive programme information system for dealing with issues related to community college programmes.

3.1 To outline the tentative components of the programme information system and indicate how they are related to each other.

3.2 To establish a conceptual framework for systematically generating data.

3.3 To investigate the personnel needs of the programme information system.

3.4 To study context, input, process and product elements that should be on file for retrieval or analysis.

3.5 To assess the adequacy of computer facilities.

3.6 To obtain computer programmes for analyzing data.

3.7 To develop provisional instruments for gathering data.

3.8 To examine procedures for administering questionnaires.

3.9 To consider methods for reporting the findings of analysis.

3.10 To study the data gathering process of the information system.

Objective 4.0: To investigate changes in organizational procedures necessary for an information system to become operational.

4.1 To investigate the extent to which organizational procedures need to be modified for the information system to become internalized.

Objective 5.0: To examine how continuance of the programme information system might be insured after pilot-testing.

Objective 6.0: To illustrate how the data generated by the programme information system could be utilized to study areas of interest to a college.

6.1 To discover whether students, employers and faculty members differ in their perceptions of the emphasis 'that is' and 'should be' placed on a set of programme goals.

6.2 To secure graduates' evaluations of the learning environment in which they received their training.

6.3 To acquire graduates' evaluations of the vocational skills taught in the programmes they attended.

6.4 To obtain graduates' evaluations of the instructional practices employed by the faculty.

6.5 To acquire from the clientele served by the College suggestions for improving programmes and services.

By achieving these objective the investigator demonstrated, that it was possible to develop a simple, inexpensive, flexible, and effective programme information system that would provide the staff of a community college with more relevant data for decision-making, and would enhance the effectiveness of the organization.

III SELECTING THE INSTITUTION FOR CONDUCTING THE STUDY

After reviewing the relevant literature and establishing the conceptual background for the study, the investigator secured calendars from the major community colleges in Western Canada, so as to familiarize himself with their programmes, admission requirements, length of courses, and general organizational procedures. A critical appraisal of the literature, provided by the college registrars, revealed a large proportion of the programmes offered, by most institutions, were ten months or longer in duration. Furthermore, some institutions placed considerable emphasis on university transfer courses. A major proportion of their students, consequently, attended university after graduation. Also, the investigator was informed by several community college staff members that students who graduated during the summer months frequently went on vacation before finding employment.

Based on these observations, the literature reviewed on follow-up studies, and the limited time for conducting the study, the investigator selected Vancouver Vocational Institute, the vocational campus of Vancouver City College, as the institution where the proposed programme information system would be developed, pilot-tested, and evaluated. According to the college's calendar, all the programmes offered, but one, were ten months or less in duration, which fitted the time framework of the study and meant most students would graduate before summer. The vocational nature of programmes suggested that graduates from this college would be more oriented to entering the labour market than many of their peers in other community colleges. Finally, since the college was located in one of Canada's most rapidly expanding urban centres, the investigator assumed that most graduates would find employment locally.

IV DESCRIPTION OF VANCOUVER VOCATIONAL INSTITUTE

Vancouver City College is located in Metropolitan Vancouver, one of the largest urban centres in Canada. Consequently, it serves the educational needs of a very diversified adult population and industrial community. In order to provide a greater range of programmes and to attract a wide cross-section of the adult population, the college is subdivided into four campuses dispersed throughout the city, each tending to specialize in certain educational fields as follows:

Langara Campus: career and university transfer programmes (mainly 2 years)

Special Programmes Division: up-grading programmes (mainly 1 year or less)

Vancouver School of Art: Fine Arts programmes (mainly 1-2 years)

Vancouver Vocational Institute: vocational programmes (mainly 1 year or less)

Though each campus has a considerable degree of autonomy in organizing its operations, developing programmes, and formulating policies, a central information centre coordinates the activities at all four campuses, informs college deans of changes in government policies, ensures programmes are not duplicated, and provides general administrative services.

As the demand for Canadian natural resources has increased, the industrial, commercial, and business sectors of Vancouver and surrounding area have expanded in order to cope with the vast quantity of goods flowing through the port. Naturally, this expansion has created a demand for a greater number of semi-skilled workers, skilled tradesmen, and technicians, to which the institute has responded by offering numerous programmes that enable adults to acquire the skills and knowledge in a short space of time. Existing programmes are continually being revised and new ones developed in an effort to satisfy the growing and changing demand for post-secondary education in the area served by the college. Since this trend is expected to continue in the future, the staff of Vancouver Vocational Institute can expect the years ahead to be very exciting and challenging.

V THE POPULATION AND SAMPLE

Due to certain limitations, to which the investigation was subjected, the programme and student samples needed for generating data were chosen with the assistance of the divisional chairman. Though the samples were not selected by a random procedure, the data gathered revealed, that members of a sample chosen from a specific division possessed a number of common characteristics. Therefore, for statistical purposes, the samples used were considered to be representative of a division's broader population.

VI ESTABLISHING RAPPORT WITH USERS

All community colleges possess an information system of some kind. Although such a system may be inadequate in many respects, it provides staff members with a limited amount of information which they utilize, to varying degrees, while performing their day to day duties.

The staff of a community college respond to change in a manner similar to members of any other organization, if they perceive a new innovation to be a threat to their economic security, social relations, position within the organization,or requiring them to undertake additional responsibilities. Dykes maintains that:

> All organizations possess built-in devices which tend to maintain stability. Acting as a gyroscope these devices seek to hold the organization in a steady state, or to return it to stability when buffeted from within or without. This tendency towards stability, seemingly inherent in all organizations, constitutes a powerful force against change.[106]

Therefore,the investigator anticipated there would be some resistance to modifications in administrative procedures and additional responsibilities that the programme information system would produce when implemented.

To minimize possible resistance to the investigation and the proposed information system, the investigator, during his initial visit to Vancouver Vocational Institute, undertook to establish good rapport with administrators, instructors, and support personnel. He did this by discussing, very casually, the purpose of the study; by emphasizing that the proposed system would improve the effectiveness of programmes, provide guidelines for directing organizational change, and establish better lines of communication between Vancouver Vocational Institute and the public it served.

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[106] Archie R. Dykes, "The Emergent Role of Administrators and the Implications for Teacher-Administrator Relationships," in Roy B. Allen and John Schmids, eds., Collective Negotiations and Educational Administration (Columbus: College of Education, University of Arkansas and University Council for Educational Administration, 1966), p. 30.

VII DATA GATHERING INSTRUMENTS

The questionnaires employed to gather data from students, faculty members,and employers were developed from the literature reviewed on dropouts, follow-up studies, programme evaluation, community colleges, faculty activity,and instructional goals. Copies of the instruments can be found in Appendices D, E and F.

Prior to any of the instruments being administered at Vancouver Vocational Institute, the investigator pilot-tested them with small groups of students at the Alberta Vocational Centre, Grant MacEwan Community College and the University of Alberta. All questionnaires were modified as a result of the comments and suggestions proposed by students during these trials. While this pilot-testing was in progress,the face and content validity of the instruments were assessed by faculty members.

The reliability of the multiple choice questionnaires, goals inventory,and motivational scale were determined by both the Kuder-Richardson formula 20,and the test-retest method. However,the former was assumed to yield the most useful reliability coefficient since most of the instruments employed were heterogeneous. Items that statistical analysis revealed that students responded to differently after a period of three weeks, were either excluded or modified.

Though the multiple-choice format adopted in most of the questionnaires limited the responses of individuals, the investigator considered that presenting questions in such a form reduced ambiguity, ensured some degree of consensus,and facilitated a speedier collection of data needed to conduct the investigation. Participants were provided with an opportunity to express their opinions and judgements on issues not covered in the multiple-choice items by the provision of 'open-ended' questions.

VIII DATA GENERATION PROCESS

The data needed to complete this investigation were gathered in four phases within the analytical framework provided by the Clarke, Konrad, Ottley and Ramer 'synthetic model'. Due to the continuous intake policy of Vancouver Vocational Institute, many of the tasks involved in generating the data were undertaken more than once. The PERT network, presented in Figure 14, specifies the activities that were performed during each phase, the order in which they were undertaken, and the time period involved. A brief description of each activity is reported in Table I.

The complexity of the process employed was considerably reduced by separating the tasks completed, by different groups, into distinct activity paths, namely:

Path I	Faculty Members
Path II	Employers
Path III	Students Group I
Path IV	Students Group II
Path V	Students Group III

All paths commenced in a conference with senior administrators, and terminated with data summation. Also, two activity paths were established for gathering data from students to accommodate the continuous admission

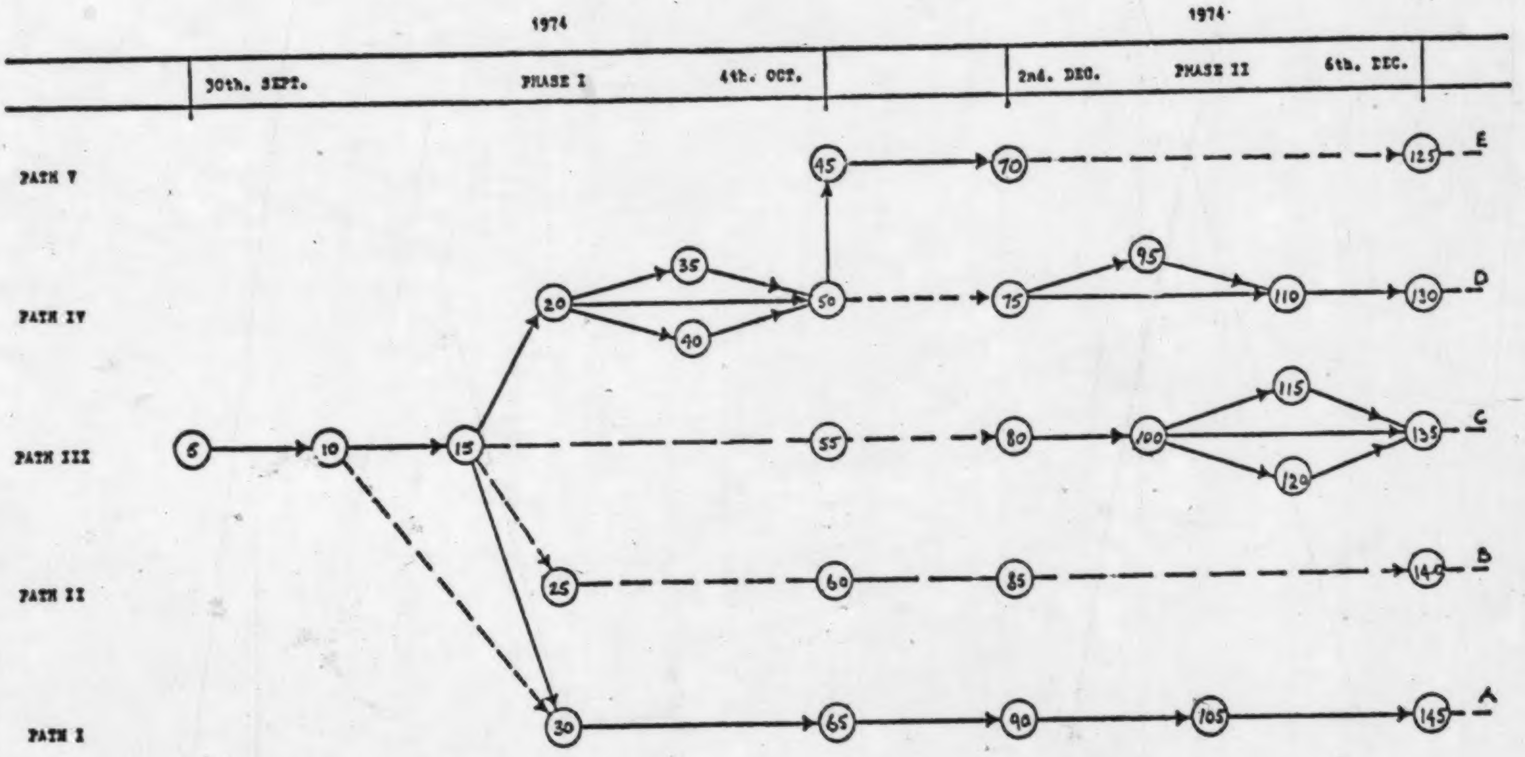
1974
1974
30th. SEPT.
PHASE I
4th. OCT.
2nd. DEC.
PHASE II
6th. DEC.
PATH V
PATH IV
PATH III
PATH II
PATH I
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
E
D
C
B
A

Figure 14

Network for Gathering Data

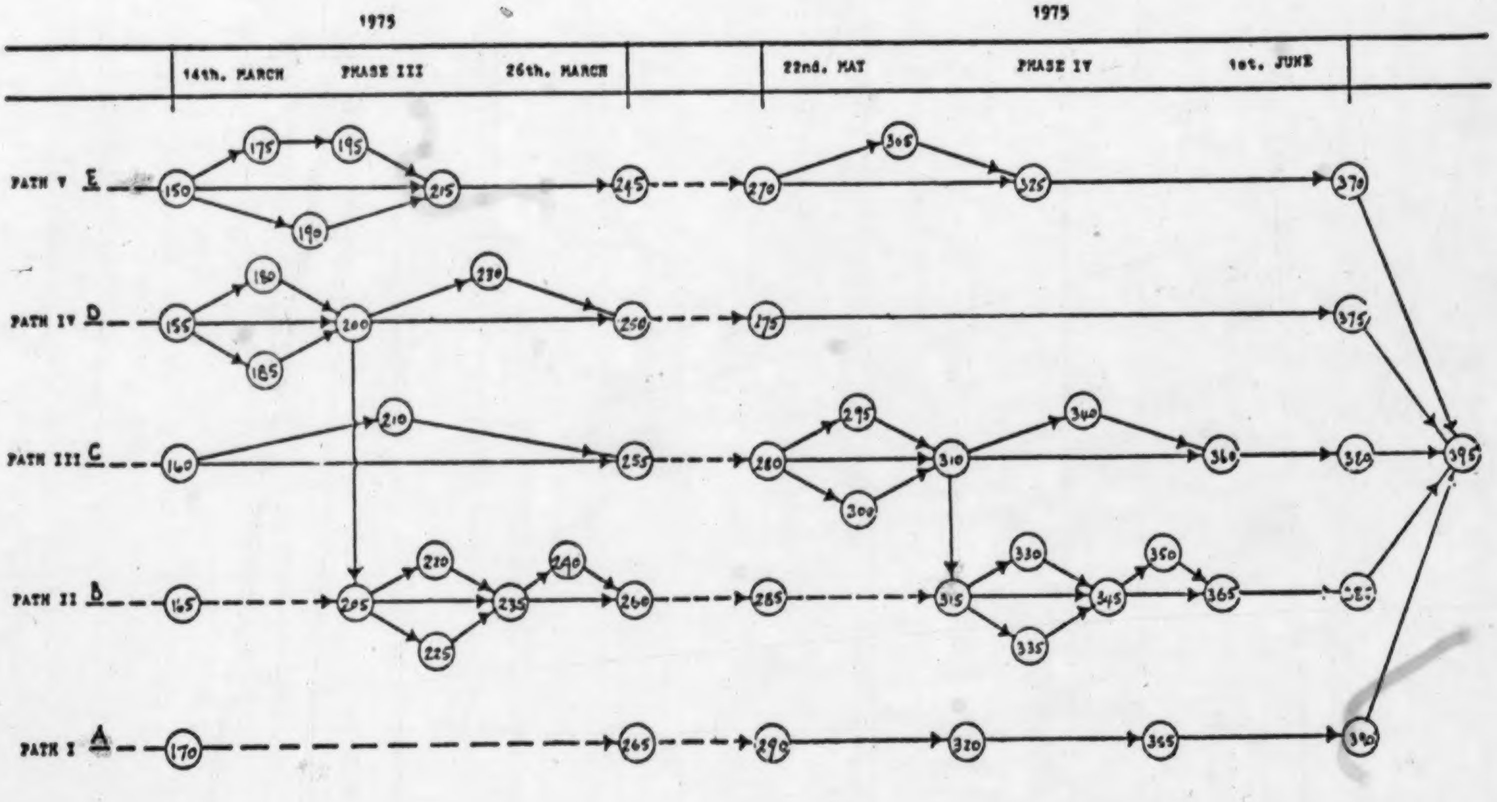
1975
14th. MARCH
PHASE III
26th. MARCH
1975
22nd. MAY
PHASE IV
1st. JUNE
PATH V E
PATH IV D
PATH III C
PATH II B
PATH I A
150
175
195
190
215
245
270
305
325
370
155
180
185
200
230
250
275
375
160
210
255
280
295
300
310
340
360
380
395
165
205
220
225
235
240
260
285
315
330
335
345
350
365
170
265
290
320
355
390

Figure 14 (Continued)

Table 1

Activities, Events and Tasks of the Data Gathering Process

	PATH I			PATH II			PATH III		
	EVENT	ACTIVITY	TASK	EVENT	ACTIVITY	TASK	EVENT	ACTIVITY	TASK
PHASE I	5-10	Conference with senior administrators	I	5-10	Conference with senior administrators	I	5-10	Conference with senior administrators	I
	10-15	Conference with staff		10-15	Conference with staff		10-15	Conference with staff	
	10-30	Conference with dept. heads		15-25	Dummy		15-55	Dummy	
	15-30	Dummy		25-60	Dummy				
	30-65	Discuss feasibility of study with staff	II						
	65-90	Review literature	V	60-85	Dummy		55-80	Dummy	
PHASE II	90-105	Develop interview schedule		85-140	Dummy		80-100	Establish rapport	
	105-145	Establishing College's data needs	V				100-115	Gain instructors co-operation	
							100-120	Study programmes	III
							100-135	Gather context and input data	
							115-135	Code questionnaire	
							120-135	Study class lists	
	145-170	Dummy		140-165	Dummy		135-160	Dummy	
PHASE III	170-265	Dummy		165-205	Dummy		160-210	Establish rapport	
				205-220	Code questionnaire		160-225	Students' evaluation of programmes	VI
				205-225	Telephone employers	I	210-255	Outline follow-up study	
				205-235	Duplicate questionnaires				
				220-235	Mail questionnaires				
				225-235	Verify name of supervisors				
	145-170	Dummy		140-165	Dummy		135-160	Dummy	
PHASE III	170-265	Dummy		165-205	Dummy		160-210	Establish rapport	
				205-220	Code questionnaire		160-225	Students' evaluation of programmes	VI
				205-225	Telephone employers	I	210-255	Outline follow-up study	
				205-235	Duplicate questionnaires				
				220-235	Mail questionnaires				
				225-235	Verify name of supervisors				
				235-240	Record returns				
				235-260	Contact employers again	II			
				240-260	Send reminders				
	265-290	Dummy		260-285	Dummy		255-280	Dummy	
PHASE IV	290-320	Establish rapport		285-315	Dummy		280-295	Code questionnaires	
	320-355	Administer goals inventory	II	315-330	Code questionnaire		280-300	Contact students	
	355-390	Gather data on faculty activity, instructional methods and innovativeness		315-335	Telephone employers	I	280-310	Duplicate questionnaires	
				315-345	Duplicate questionnaires		300-310	Secure name of employers	VIII
				330-345	Mail questionnaires		310-315	Record name of employers	
				335-345	Verify name of supervisors		310-360	Record returns	
				345-350	Record returns		310-360	Contact employers again	
				345-365	Contact employers again	II	340-360	Send reminder	IX
				350-365	Send reminders		340-380	Contact non-respondents.	
				365-385	Contact non-respondents				
	390-395	Summarise data	XII	385-395	Summarise data	XII	380-395	Summarise data	XII

Table 1 (Continued)

	PATH IV			PATH V		
	EVENT	ACTIVITY	TASK	EVENT	ACTIVITY	TASK
PHASE I	5-10	Conference with senior administrators		50-65	Review literature	IV
	10-15	Conference with staff	I			
	15-20	Establish rapport				
	20-35	Secure instructors co-operation				
	20-40	Study programmes	III			
	20-50	Gather context and input data				
	35-50	Code question-naires				
	40-50	Study class lists				
	50-75	Dummy		65-70	Revise goals inventory	IV
PHASE II	75-95	Establish rapport		70-125	Dummy	
	75-110	Students' evaluation of programme	VI			
	95-110	Outline follow-up study				
	110-130	Arrange for instructors to administer questionnaire				
	130-155	Dummy		125-150	Dummy	
PHASE III	155-180	Code questionnaire		150-175	Secure name of employers	
	155-185	Contact students		150-190	Establish rapport with students	
	155-200	Duplicate questionnaire		150-215	Duplicate questionnaire	
	180-200	Mail questionnaire	VIII	175-195	Telephone employers	VII
	185-200	Secure name of employers		190-215	Administer questionnaires	
	200-205	Record name of employers		195-215	Code questionnaire	
	200-230	Record returns		215-245	Mail questionnaire	
	200-250	Contact employers again	IX			
	230-250	Send reminder				
	250-275	Dummy		245-270	Dummy	
PHASE IV	275-375	Contact non-respondents	IX	270-305	Record returns	
				270-325	Contact employers again	IX
				305-325	Send reminders	
				325-370	Contact non-respondents	
	375-395	Summarize data	XII	370-395	Summarize data	XII

policy of the College. Furthermore, a study of the network reveals that twelve major tasks were completed between September 1974 and May 1975 (Table 2).Some involving all participants,while others involved only one group.

During phase one the goals inventory was found to be unsatisfactory. It was modified and administered to a group of students who, though not members of the sample selected for the study, were attending similar programmes. The conceptual model presented in Figure 15 describes, in precise terms, the major dimensions of the data gathering process utilized,and indicates some of the general inter-relationships among them.

IX DATA ANALYSIS

After all the data had been gathered,they were summarized, tabulated,and punched on cards for future analysis on the computer. The purpose of analyzing the data was to indicate how the information generated by the programmeinformation system might be utilized to examine various aspects of community college activity and the public it serves. Obviously,the data gathered could be employed to study numerous issues related to a college's clientele and internal organization; therefore,analysis was focused on five areas namely:

1. Programme goals
2. Learning environment
3. Vocational skills
4. Instructional practices
5. Recommendations for improvements

Table 2

Tasks Performed in Gathering Data

Task	Description
I	Gaining support for the study
II	Determining the feasibility of the investigation
III	Gathering context and input data
IV	Revising the goals inventory
V	Determining the College's data requirements
VI	Obtaining students evaluation of programmes (output data)
VII	Securing data on prgramme goals from employers and students
VIII	Conducting follow-up study of students (output data)
IX	Encouraging participants to respond
X	Securing employers evaluation of programmes (output data)
XI	Acquiring data from staff on instructional goals, professional duties, instructional methods and innovativeness
XII	Summarizing data for analysis

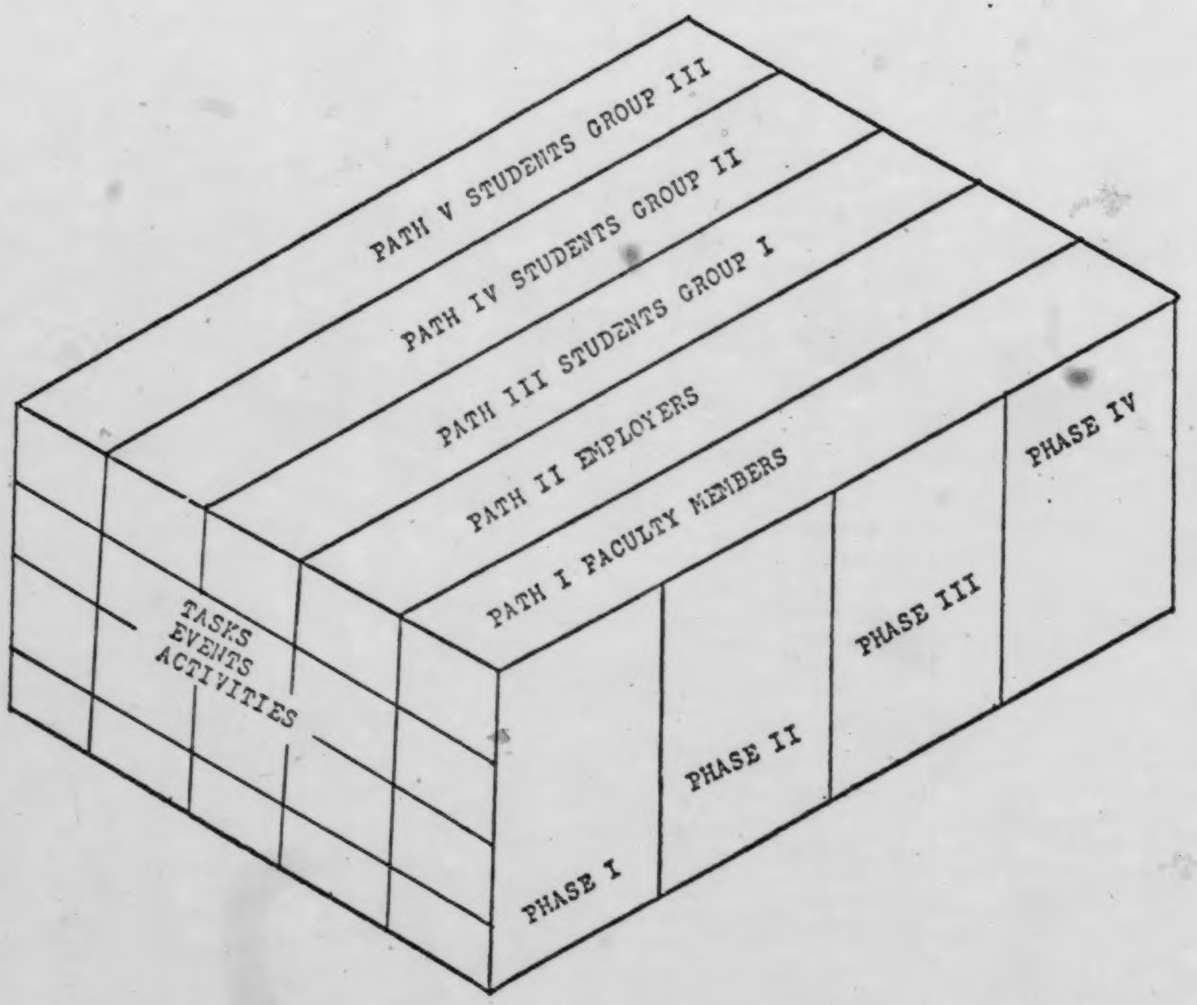
PATH V STUDENTS GROUP III
PATH IV STUDENTS GROUP II
PATH III STUDENTS GROUP I
PATH II EMPLOYERS
PATH I FACULTY MEMBERS
PHASE I
PHASE II
PHASE III
PHASE IV
TASKS
EVENTS
ACTIVITIES

Figure 15

Data Gathering Process Model

These issues were selected for study after discussions with the staff of Vancouver Vocational Institute, a survey of literature on community colleges,and conferences with educators interested in post-secondary education.

To facilitate analysis,the data gathered were coded so the investigator would know at a glance in which programme and department a student was registered,and whether he graduated or discontinued attendance. Although many of the participants,who failed to provide all the data requested,were contacted by telephone,during the follow-up phase of the investigation, the investigator was unable to obtain a complete set of data for a number of individuals. This problem of missing data was resolved by assigning to participants,who failed to answer a specific item on a questionnaire, a response chosen at random from those provided by other individuals in his group, a method recommended by Kelly et al,[107] as long as the non-respondents to any item were less than ten percent of the total sample.

When a complete set of data for all participants had been recorded on computer cards, a survey of the information available for analysis, revealed that it would be impossible to examine all the programmes in detail. The investigator,therefore,delineated the analysis to mainly studying the problems at a college level, though several issues were examined within a department to indicate how analysis might be conducted at a micro-level. The statistical procedures employed varied according to the nature of the problem under examination,and the level at which analysis was conducted; though, in all instances, computer programmes were utilized to complete the necessary computations.

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[107] Francis J. Kelly, et al., Research Design in the Behavioural Sciences: Multiple Regression Approach (Carbondale and Edwardsville: Southern Illinois University Press, 1969), pp. 249-250.

X REDEVELOPING THE SYSTEM

After implementing the system, and analyzing the data generated, it bacame evident that the procedures, questionnaires, and processes employed in the investigation needed modifying in order to improve the systems effectiveness. Furthermore, it was apparent that some provision was necessary for involving staff members in the selection of data elements, identifying areas of common concern, and ensuring that reports were distributed, reviewed, and discussed.

According to the literature reviewed, an internal change agency should be established in an institution for an innovation, such as the programme information system developed in this investigation, to become an integral part of an institution's administrative process. A committee, therefore, needed forming to organize, plan, and administer the implementation of the system, on a trial basis, at the College. Since an issue of this kind was outside the framework of the study, it was not examined in depth.

CHAPTER V

THE PROGRAMME INFORMATION SYSTEM

I INTRODUCTION

The development process employed in this investigation was based on a sequence of interrelated activities proposed by Hussain in his book Development of Information Systems for Education that commences with a feasibility study and terminates with a self-renewal stage. The numerous phases of the process are presented in Figure 16, which indicates their nature and the sequence in which they occur. The different phases represented by the activity paths in the network consist of numerous events. Therefore, before proceeding from one phase to another, a sequence of events has to be completed. In order to facilitate the study of these events, the activity paths under discussion were flow-charted and the various phases of the development process described as they were actually completed.

The purpose of this chapter is to outline how the investigator employed Hussain's development process, systems analysis, and the 'synthetic model' to develop a programme information system capable of generating accurate, detailed, and recent data for community college personnel. During the development process certain unique characteristics of Vancouver Vocational Institute were incorporated in the design of the information system. However, with minimal modifications, the investigator considers the systems could be effectively utilized in any small community college.

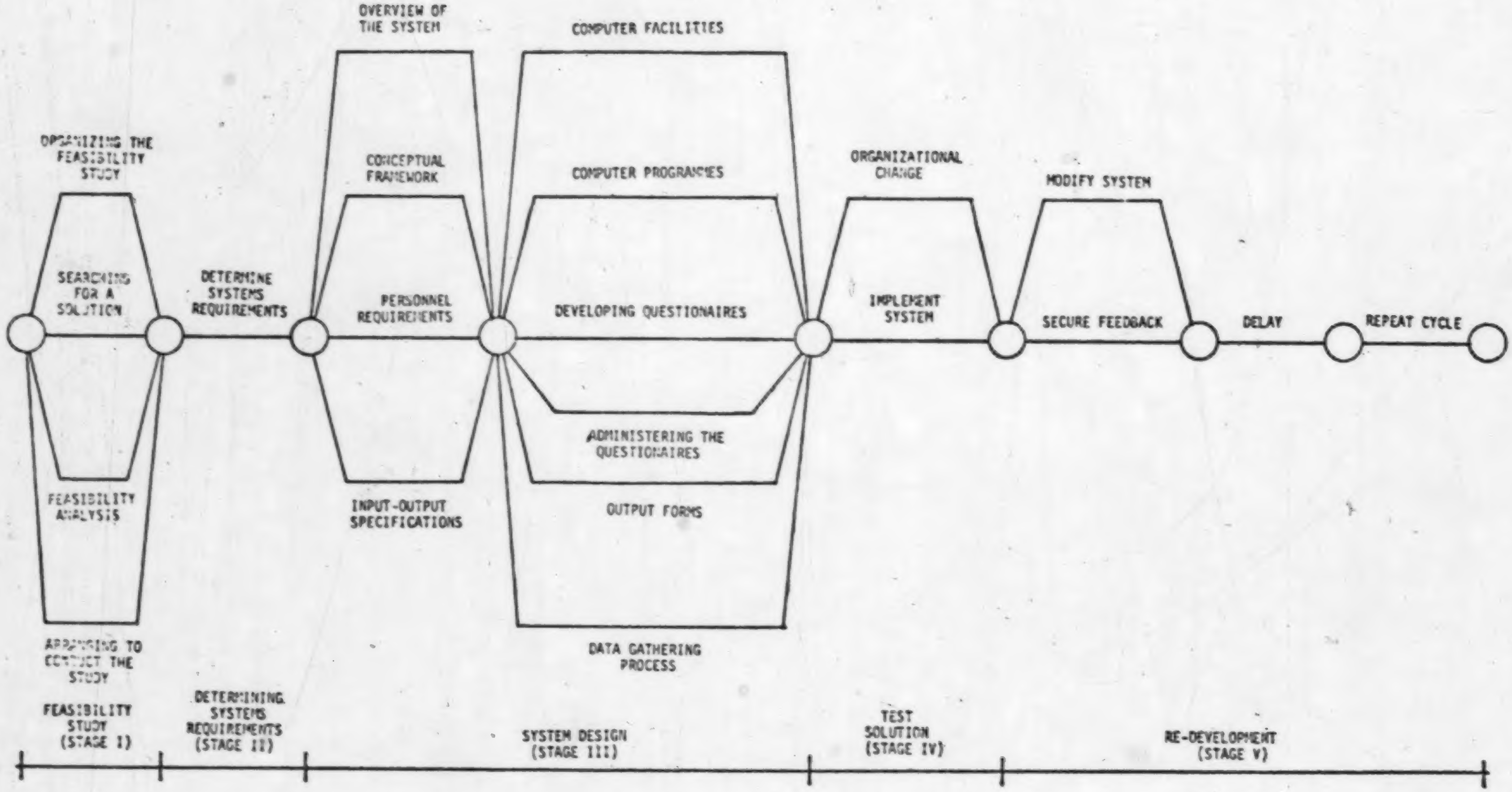
ORGANIZING THE FEASIBILITY STUDY
SEARCHING FOR A SOLUTION
FEASIBILITY ANALYSIS
ARRANGING TO CONDUCT THE STUDY
DETERMINE SYSTEMS REQUIREMENTS
OVERVIEW OF THE SYSTEM
CONCEPTUAL FRAMEWORK
PERSONNEL REQUIREMENTS
INPUT-OUTPUT SPECIFICATIONS
COMPUTER FACILITIES
COMPUTER PROGRAMMES
DEVELOPING QUESTIONAIRES
ADMINISTERING THE QUESTIONAIRES
OUTPUT FORMS
DATA GATHERING PROCESS
ORGANIZATIONAL CHANGE
IMPLEMENT SYSTEM
MODIFY SYSTEM
SECURE FEEDBACK
DELAY
REPEAT CYCLE
FEASIBILITY STUDY (STAGE I)
DETERMINING SYSTEMS REQUIREMENTS (STAGE II)
SYSTEM DESIGN (STAGE III)
TEST SOLUTION (STAGE IV)
RE-DEVELOPMENT (STAGE V)

Figure 16

Process for Developing the Information System

II THE FEASIBILITY STUDY

Analysis was directed to attaining the first primary objective:

Objective 1.0: To establish whether a programme information system would be beneficial to the staff of a community college.

Organizing the Feasibility Study

Objective 1.1: To investigate some of the problems existing in community coleges.

Though community colleges have grown rapidly and become more numerous during the past two decades, the literature reviewed revealed that there was scarcity of information regarding their activities, the nature of the clientele they attract, and scope of functions they were expected to serve. These general findings were substantiated by a number of community college staff members, government officials, and university faculty with whom the investigator discussed issues such as decision-making, planning and evaluation in community colleges. The literature review revealed that there was a scarcity of information regarding the activities of community colleges, though they had been growing rapidly and become more numerous during the past two decades. Furthermore, there was general agreement among a number of community college staff members, government officials, and university professors, interviewed by the investigator, that better quality information was needed for planning, developing and evaluating programmes. Based on these findings, the investigator concluded there was need for a simple, inexpensive, but effective porgramme information system, that would generate data community college personnel could utilize to resolve some of the problems they were encountering.

In the literature it was also reported that most information systems, presently available for use in community colleges, were inadequately designed. Therefore, they were inappropriate for the Canadian setting, expensive to install and maintain, or too complex for the staff of a small college to utilize effectively. Due to one or more of these factors, the administrative staff of small community colleges in Western Canada have been reluctant to install a sophisticated information system in their institutions.

A proposal was developed for establishing a programme information system and presented to a committee for appraisal. Based on recommendations proposed by this group, the proposal was modified and then mailed to the principal of Vancouver Vocational Institute (see Figure 17). Upon contacting the principal by telephone, the investigator was informed that a labour-management dispute had resulted in the College being temporarily closed. As a result of this situation the commencement of the investigation was postponed until late September. The investigator recognized that special attention would need to be given to developing good rapport with the faculty, upon his initial visit to the College, in order to off-set the adverse effects of the dispute.

Searching for a Solution

Objective 1.2: To identify information the faculty of a community college need to function more effectively.

Since the principal of the Institute granted permission with no hesitation, permission for the study to be conducted at the College, the investigator concluded that he could depend upon the majority of the staff being cooperative during the data generating phases. If the principal had expressed concern about any aspect of the study, the proposal would have been revised to remove or modify the specific issues (see Figure 18).

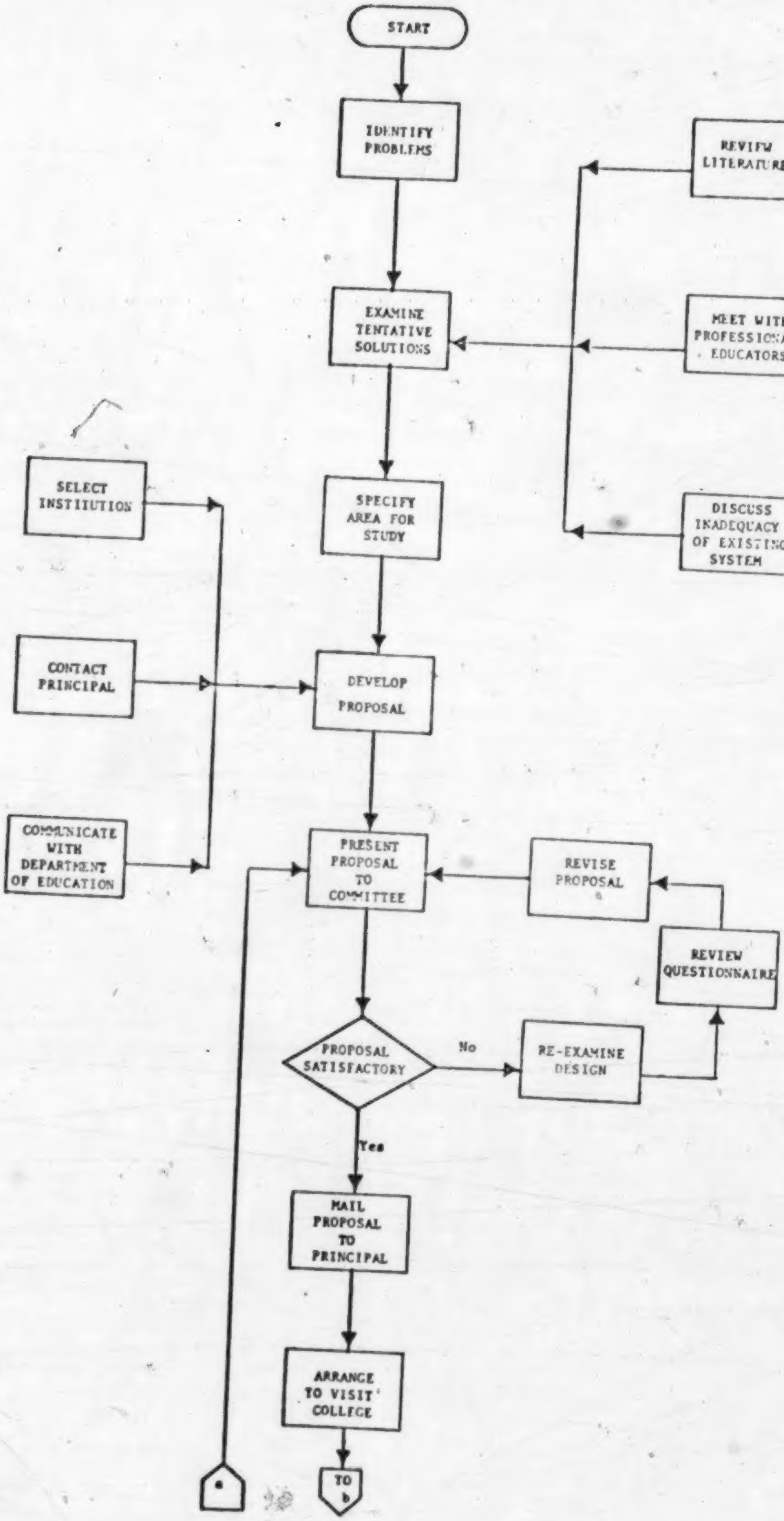
START
IDENTIFY PROBLEMS
REVIEW LITERATURE
EXAMINE TENTATIVE SOLUTIONS
MEET WITH PROFESSIONAL EDUCATORS
SPECIFY AREA FOR STUDY
DISCUSS INADEQUACY OF EXISTING SYSTEM
SELECT INSTITUTION
CONTACT PRINCIPAL
DEVELOP PROPOSAL
COMMUNICATE WITH DEPARTMENT OF EDUCATION
PRESENT PROPOSAL TO COMMITTEE
REVISE PROPOSAL
REVIEW QUESTIONNAIRE
PROPOSAL SATISFACTORY
No
RE-EXAMINE DESIGN
Yes
MAIL PROPOSAL TO PRINCIPAL
ARRANGE TO VISIT COLLEGE
a
TO b

Figure 17

Organizing the Feasibility Study

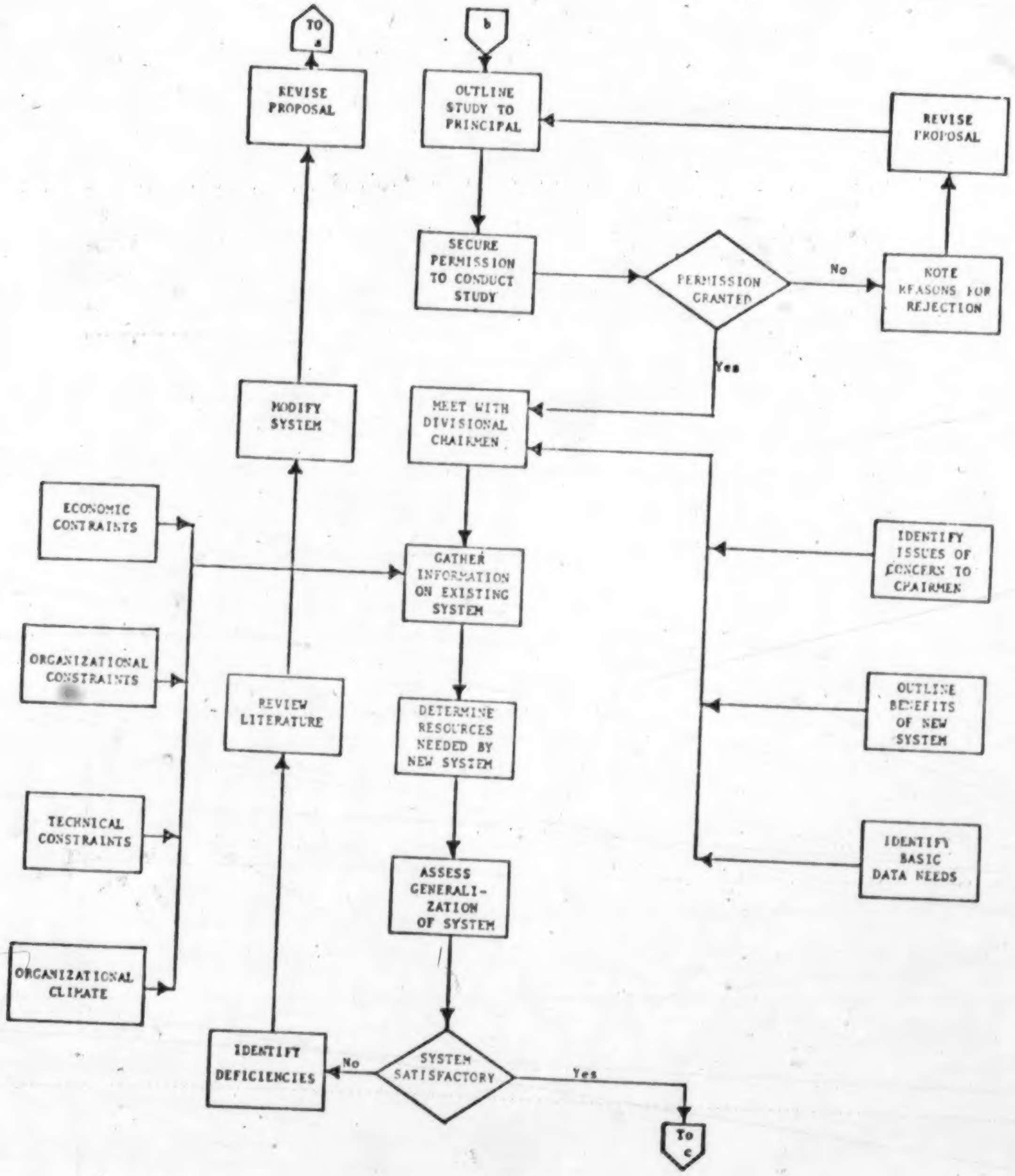
TO a
b
REVISE PROPOSAL
OUTLINE STUDY TO PRINCIPAL
REVISE PROPOSAL
SECURE PERMISSION TO CONDUCT STUDY
PERMISSION GRANTED
No
NOTE REASONS FOR REJECTION
Yes
MODIFY SYSTEM
MEET WITH DIVISIONAL CHAIRMEN
ECONOMIC CONTRAINTS
GATHER INFORMATION ON EXISTING SYSTEM
IDENTIFY ISSUES OF CONCERN TO CHAIRMEN
ORGANIZATIONAL CONSTRAINTS
REVIEW LITERATURE
DETERMINE RESOURCES NEEDED BY NEW SYSTEM
OUTLINE BENEFITS OF NEW SYSTEM
TECHNICAL CONSTRAINTS
IDENTIFY BASIC DATA NEEDS
ASSESS GENERALIZATION OF SYSTEM
ORGANIZATIONAL CLIMATE
IDENTIFY DEFICIENCIES
No
SYSTEM SATISFACTORY
Yes
To c

Figure 18

Searching for a Solution

At the principal's suggestion,a meeting was arranged with the divisional chairmen to discuss the proposed programme information system since, as he pointed out, these members of his staff were sensitive to the needs of industry, aware of the instructors' concerns, and knowledgeable about the numerous programmes offered by the College. It was apparent to the investigator that,in addition to being influential opinion leaders and change agents, these middle management administrators were important 'gatekeepers' of information therefore it was necessary to secure their moral support.

Upon being informed about the purposes and objectives of the investigation,the divisional chairmen responded positively and indicated they were willing to provide the assistance, resources,and information needed to complete the study. Rapport was quickly established between the investigator and the senior members of the administration, which later facilitated the prompt and smooth completion of several stages of the development process. If these administrators had responded somewhat negatively towards the study, additional time would have been devoted to identifying the sources of their resistance and securing recommendations for improving the proposal.

During the numerous informal meetings with the divisional chairmen, the potential benefits of a programme information system were explored, issues confronting the College were identified,and suggestions for resolving certain problems were noted.

A meeting with the Assistant Dean revealed that most departments had developed small information systems of their own which they periodically employed to obtain background data from students, evaluate graduates, secure limited feedback from students, and communicate with employers. An independent, departmental information system had become established over time. Consequently, the quality as well as the quantity of data on students and programmes varied considerably from one department to another.

The investigator found that the only data gathered systematically for all departments were a few personal items provided by fee paying students interviewed by counsellors. Furthermore, only a small proportion of the graduates usually returned the follow-up questionnaire. These findings supported the administration's general concern over the inadequacy of the College's present information system and justified a new system being developed.

The only concern expressed by the principal during the investigator's initial visit to the College was regarding the cost of developing and pilot testing the system in terms of personnel, resources, and expenses. This anxiety arose from his having read several articles on management information systems. These articles apparently made the claim that such systems were usually expensive to install and operate.

A tentative budget (Table 3) for the study revealed the investigation could be conducted at Vancouver Vocational Institute at a minimal cost of $300 to the College, an expenditure that was acceptable to the principal. However, it is important to note that this estimate did not include the expenditures incurred by the investigator, Canada Council, and the University of Alberta, which were associated with:

1. Developing and pilot testing questionnaires
2. Air travel to Vancouver for the investigator
3. Accommodation in Vancouver for the investigator while the study was in progress

Table 3

Tentative Budget Estimates for Developing
and Pilot-Testing Programme
Information System

Item	Expenditure	
Personnel		
Project Administrator	N/C	
Research Assistant	$ 40	
Recording Clerk	50	
		$ 90
Communications, Supplies and Services		
Postage	$ 80	
Duplicating	90	
Telephone	10	
Stationery and Supplies	20	
		$200
Contingency	$ 10	
		$ 10
Total		$300

4. Long distance telephone calls
5. Services of a computer programmer
6. Computer time needed to analyze data
7. Mailing reminder letters to participants
8. Typing, duplicating and binding thesis
9. Telephoning participants, analyzing data and incidental tasks associated with the study.

Therefore, a more comprehensive budget has been presented in Appendix B.

Since Vancouver Vocational Institute was not a typical community college, the investigator considered it was essential to assess, during this phase of the feasibility study, whether the proposed system could be generalized. Though certain features of the system were shaped by the unique characteristics of Vancouver Vocational Institute, the investigator found it sufficiently flexible for application in similar types of post-secondary institutions.

Feasibility Analysis

Objective 1.3: To assess the feasibility of developing and implementing the programme information system.

After the generalizability of the proposed system had been established the feasibility of developing and implementing the new system at Vancouver Vocational Institute was assessed. The resource requirements, identified in the budget as necessary for pilot testing the system, were revised and the data gathering procedures were appraised to ensure that major resource needs of the system had been recorded. The economic, organizational, technical and human constraints under which the College functioned were discussed, with the divisional chairmen and contrasted with the resource requirements of the system (see Figure 19).

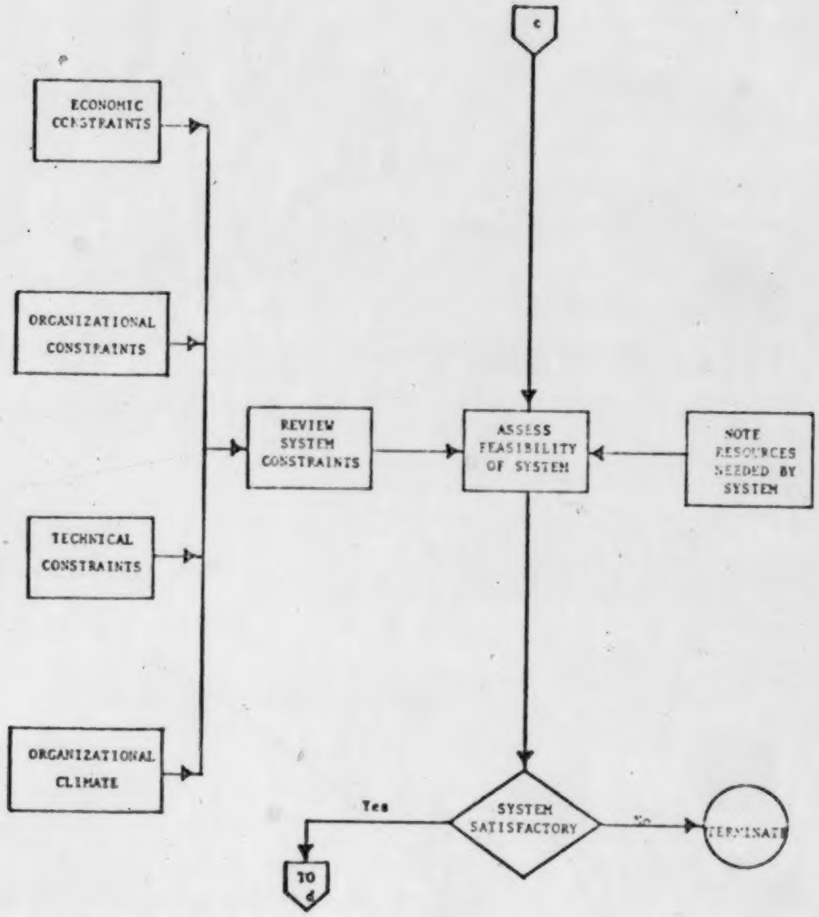
c
ECONOMIC CONSTRAINTS
ORGANIZATIONAL CONSTRAINTS
REVIEW SYSTEM CONSTRAINTS
ASSESS FEASIBILITY OF SYSTEM
NOTE RESOURCES NEEDED BY SYSTEM
TECHNICAL CONSTRAINTS
ORGANIZATIONAL CLIMATE
Yes
SYSTEM SATISFACTORY
No
TERMINATE
TO d

Figure 19

Feasibility Analysis

After a number of conferences, with the divisional chairmen, the investigator concluded that the only constraints which might adversly affect the investigation were the College's history of minimal organizational change, the reluctance of certain faculty members to participate in research studies, and the faculty's general skepticism of academically oriented issues. Based on the literature reviewed, the investigator decided that resistance to the proposed information system would be substantially reduced if considerable attention was devoted to establishing good rapport with the faculty, emphasizing the benefits of the system, and employing, whenever possible, suggestions proposed by instructors.

It was clearly apparent that the success of the study depended to a significant degree upon the investigator's ability to quickly establish a satisfactory relationship with the faculty of the College. Also, it was recognized that a similar relationship would have to be developed with the students if they were to provide the data required, especially in the follow-up part of the study.

Though the faculty's potential resistance to the study was high, the investigator did not consider it to be of sufficient magnitude to warrant the investigation being terminated. This proposition was based on the fact that the faculty was dissatisfied with certain aspects of the College's operation, which the proposed information system could indirectly improve. Furthermore, since the study only slightly disrupted faculty members' normal schedule, it was obviously to their advantage to morally support the investigation. During informal meetings, the investigator emphasized and discussed, in detail, the numerous benefits the proposed system would yield.

Arranging to Conduct the Study

Objective 1.4: To establish rapport with participants and arrange for conducting the investigation.

Once the investigation had been assessed as feasible, a conference was scheduled with the principal to arrange for the questionnaires to be duplicated, so they would be available for distribution at the commencement of each data gathering phase. During this conference,the investigator secured the services of a secretary for recording the returned questionnaires, arranged for a senior student to be employed as a research assistant,and acquired an office from which to conduct the investigation.

With the assistance of the divisional chairman,the programmes to be studied were chosen based on the following criteria:

1. A chairman's request that a programme be included in the sample.
2. The date when a programme commenced.
3. The duration of a programme.
4. Whether there were continuous admission into a programme.

The selection of these criteria was founded on the need for a stable sample, the divisional chairmen's knowledge of the College, the nature of the research,design and the constraints to which the investigation was subjected.

The computer programmer reported that a Hewlett Packard HP200 computer had recently been installed in the College to provide additional computer facilities for the four campuses of Vancouver City College and to furnish the necessary hardware for a computer science programme. Though the hardware and computer language of the Hewlett Packard HP200 differed from that which the investigator intended to employ to analyze data, the manufacturer stated in the user's catalogue that it was possible to use other languages than BASIC. If existing facilities were found to be inadequate in a pilot application of the system at the College, additional hardware would have to be acquired or computer time purchased on a more sophisticated installation.

The final event of this phase was completed by the investigator visiting the classes at the College to discuss the purpose of the investigation, to encourage the students to participated, to answer any questions related to the study, and to commence establishing a good relationahip. Informal conferences were held with instructors to outline, in detail, the potential benefits of the system, to establish a congenial relationship, to listen to their concerns, and to secure assistance in gathering the data.

The investigator found from the rapport established with the faculty, the resources acquired to conduct the study, the programmes selected for investigation, and the tentative data gathering schedule, that satisfactory conditions existed at Vancouver Vocational Institute for developing and pilot-testing the proposed programme information system (see Table 20).

III DETERMINING THE ORGANIZATION'S INFORMATION NEEDS

Analysis was directed to attaining the second primary objective:

> Objective 2.0: To determine the user's requirements of the programme information system.

Identifying User's Requirements

> Objective 2.1: To determine the faculty's information requirements and identify potential constraints.

Prior to designing an information system, user's requirements and constraints to which the system will be subjected have to be clearly

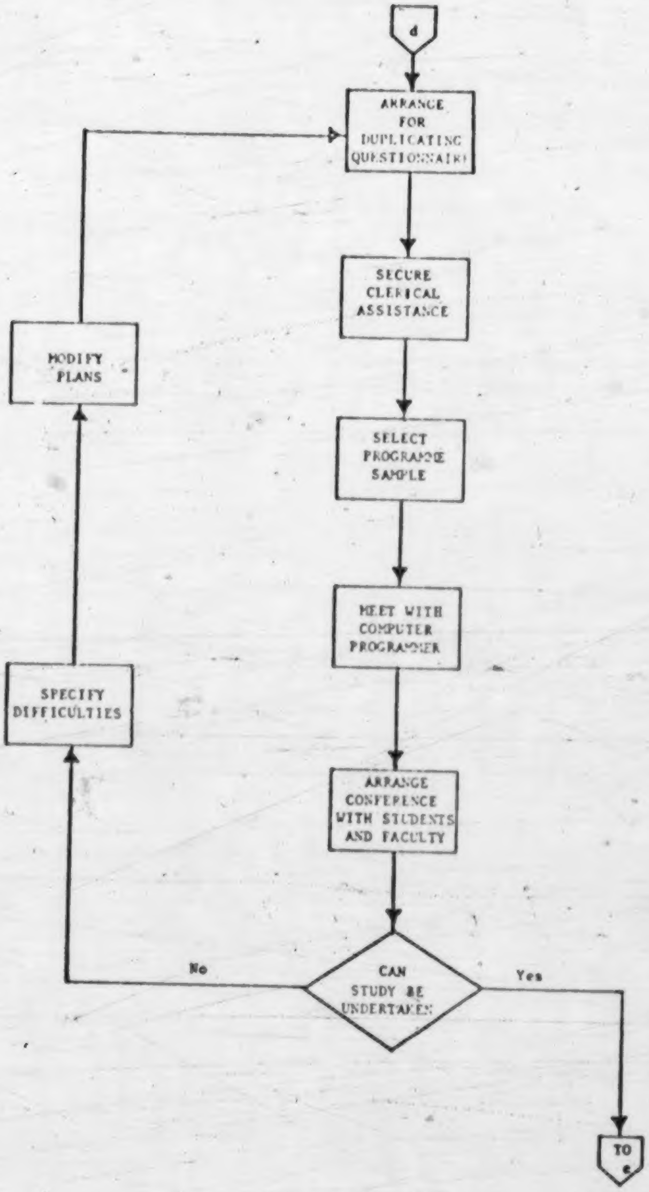
d
ARRANGE FOR DUPLICATING QUESTIONNAIRE
SECURE CLERICAL ASSISTANCE
SELECT PROGRAMME SAMPLE
MEET WITH COMPUTER PROGRAMMER
ARRANGE CONFERENCE WITH STUDENTS AND FACULTY
CAN STUDY BE UNDERTAKEN
No
Yes
SPECIFY DIFFICULTIES
MODIFY PLANS
TO e

Figure 20

Arranging to Conduct the Study

identified. Therefore, after completing the feasibility study, the investigator proceeded to arrange interviews with twenty-seven faculty members selected at random from those associated with the programme selected for study. The purpose of these interviews was to obtain the facultys' opinion on:

1. The basic information needs of the College.
2. The adequacy of the existing information system.
3. The feasibility of introducing a new system into the Institute.
4. How better quality data could be utilized.

The information obtained from the faculty was used to establish data files, modify the design of the system, develop questionnaires, and identify output requirements. By involving a cross-section of the faculty in identifying user's data needs, it was anticipated that the programme information system developed would be more acceptable to users and better able to satisfy the data needs of the College.

Though differences of opinion existed among faculty members, there was general consensus that more detailed information should be available on students prior to admission or as soon as possible after classes commenced. In compliance with community college philosophy, Vancouver Vocational Institute practiced an 'open-door' policy which a number of faculty members felt allowed students to enter highly specialized occupational programmes for which they had neither the academic preparation, motivation or personality; consequently, they recommended that either the policy should be modified or more information gathered from students before they entered a programme.

Furthermore, faculty members indicated that they would be interested in discovering: (1) whether graduates secured the type of employment for which they had been trained; (2) how satisfied graduates were with their programmes; (3) whether graduates had any suggestions for improving the training offered; and (4) what salaries graduates were receiving.

Though many faculty members noted that they were in continuous contact with their colleagues in the trade through professional associations and social activities, there was general agreement that more attention, in the future, must be devoted to improving the College's public relations with the business, commercial, and industrial communities it served. Several instructors also reported that, until recently, many high school students were unaware of the programmes offered by the Institution. This situation, in their opinion needed immediate improvement.

One of the major concerns of most faculty members was the increased involvement of Canada Manpower in the College's affairs. Though they acknowledged the survival of the Institute depended, to a significant extent upon Canada Manpower sponsored students, they were generally distressed by the pressure Canada Manpower was exerting on the programmes being taught. The investigator perceived that many faculty members were beginning to believe they had minimal control over the College's destiny. It was evident that the relationship between both these agencies could be improved if the role of Canada Manpower was clearly defined; more information provided by Canada Manpower on the students it sponsored; and Canada Manpower representatives were involved to a greater extent in curriculum development.

When questioned about programme goals,most faculty members reported these were not specifically stated in writing but rather set by an individual's standards of excellence as a master tradesman. Though most of the instructors interviewed considered this situation to be satisfactory, several did acknowledge that abstract programme goals and well defined instructional objective would provide a framework for assessing performance. Furthermore, several individuals conceded that a clear definition of programme goals would have been very useful in resolving many of the problems they had recently been encountering in modifying curricula.

During these interviews,faculty members were requested to identify any constraints or college policies they perceived would impede the pilot testing or later installation of the proposed programme. There was general consensus among the faculty members that many of their colleagues considered academic research to be of minimal value and viewed organizational change with skepticism. This situation was mainly caused by many faculty members having unsatisfactory experiences with researchers in the past. Several individuals also doubted whether such a system would function effectively for any period of time after installation; emphasizing that adequate consideration must be given to self-renewal and the internalization of the system.

After the interviews had been completed, the investigator undertook a comprehensive literature review to better familiarize himself with some of the issues raised by the faculty, examine research conducted on community college's clientele, and discover how other institutions were coping with the problems identified. Based on the faculty interviews and literature search, five primary areas for study were identified which determined the nature of the questionnaires, data files, and output of analysis. The programme information system was then critically appraised to determine whether it was capable of generating the required data (see Figure 21).

Informal meetings were held with faculty, who had indicated they were willing to participate in the study, to discuss the investigation, arrange for administering the questionnaires and nurture the congenial relationships that had been established during the feasibility study. The tasks involved in gathering data were identified and the sequence in which they were completed outlined in a PERT network, described previously in the methodology. Also, there was some discussion as to how the data would be recorded, reported and disseminated at a later date.

IV SYSTEM DESIGN

Analysis was directed to attaining the third primary objective:

> Objective 3.0: To design a simple, flexible, and inexpensive programme information system for dealing with issues related to community college programmes.

An Overview of the System

> Objective 3.1: To outline the tentative components of the programme information system and indicate how they are related to community college programmes.

Once the user's needs and potential constraints had been identified and recorded, the investigator undertook a comprehensive literature review

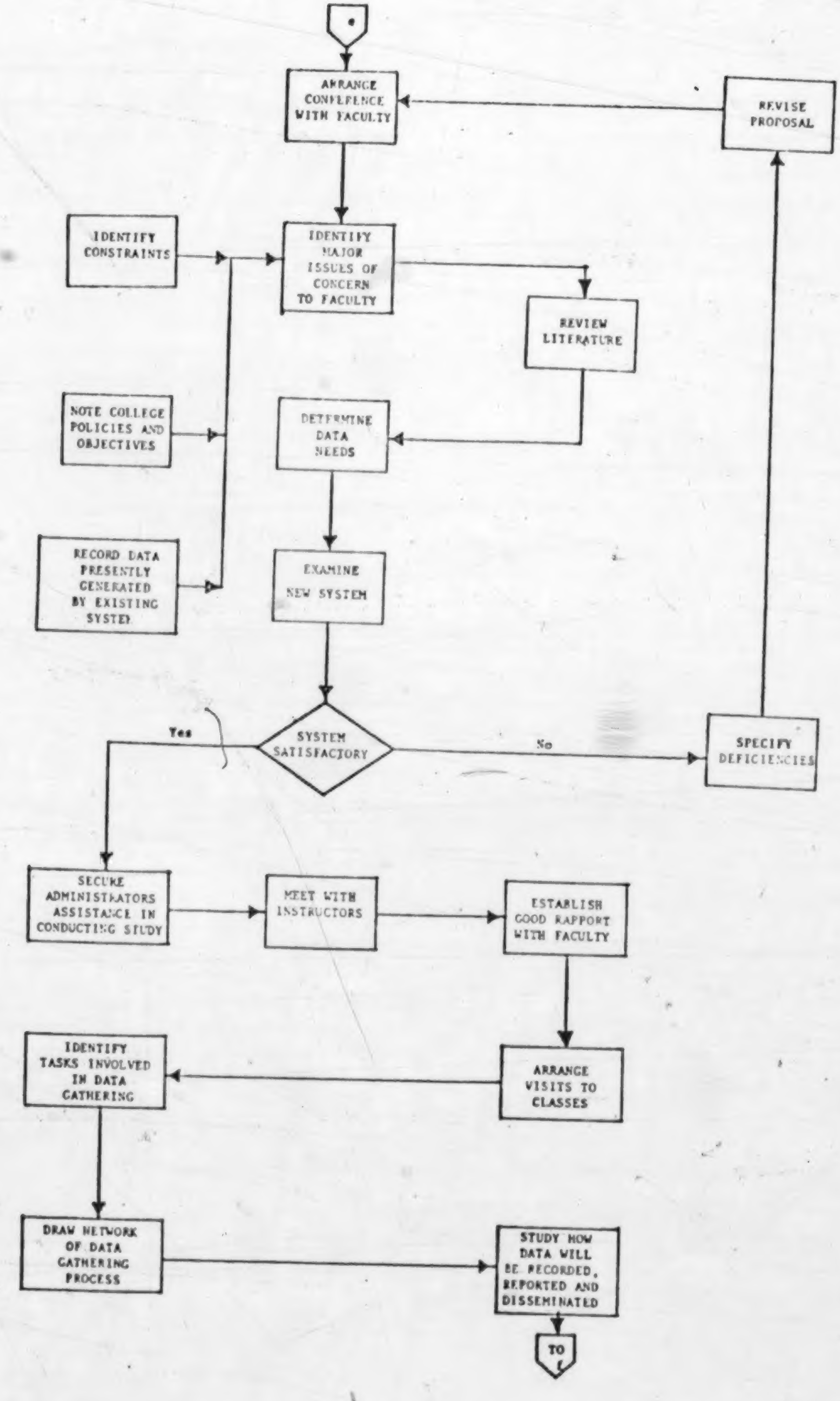
ARRANGE CONFERENCE WITH FACULTY
REVISE PROPOSAL
IDENTIFY CONSTRAINTS
IDENTIFY MAJOR ISSUES OF CONCERN TO FACULTY
REVIEW LITERATURE
NOTE COLLEGE POLICIES AND OBJECTIVES
DETERMINE DATA NEEDS
RECORD DATA PRESENTLY GENERATED BY EXISTING SYSTEM
EXAMINE NEW SYSTEM
Yes
SYSTEM SATISFACTORY
No
SPECIFY DEFICIENCIES
SECURE ADMINISTRATORS ASSISTANCE IN CONDUCTING STUDY
MEET WITH INSTRUCTORS
ESTABLISH GOOD RAPPORT WITH FACULTY
IDENTIFY TASKS INVOLVED IN DATA GATHERING
ARRANGE VISITS TO CLASSES
DRAW NETWORK OF DATA GATHERING PROCESS
STUDY HOW DATA WILL BE RECORDED, REPORTED AND DISSEMINATED
TO

Figure 21

Identifying User's Requirements

to familiarize himself with the various structural dimensions, present stage of development, and recent applications of information systems. Upon completing this survey of the literature, the investigator decided to employ a development process proposed by Hussain in his book Development of Information Systems for Education, as the foundation for establishing a programme information system. This process was comprised of four major stages, namely:

Stage I	Feasibility Study
Stage II	Determining Systems Requirements
Stage III	System Design
Stage IV	Test Solution

Since this was a developmental study, many of the proposed systems components were only of a tentative form Consequently, a fifth stage recommended by Hussain for undertaking modifications was included (see Figure 22).

Meetings with community college administrators, colleagues in the Department of Educational Administration, and faculty members at the University of Alberta revealed that most community colleges in Western Canada either possessed or had access to computer facilities; therefore, the system was computer based. The investigator acknowledges that installations might vary from one institution to another, but, as the feasibility study revealed, hardware manufacturers often make provision for their installations to utilize more than one language.

The design of the system was shaped to a significant extent by the following criteria: (1) inexpensive to install; (2) easy to implement; (3) simple to operate; (4) quickly modified; and (5) useful data generated. These standards were partially satisfied by utilizing, wherever possible,

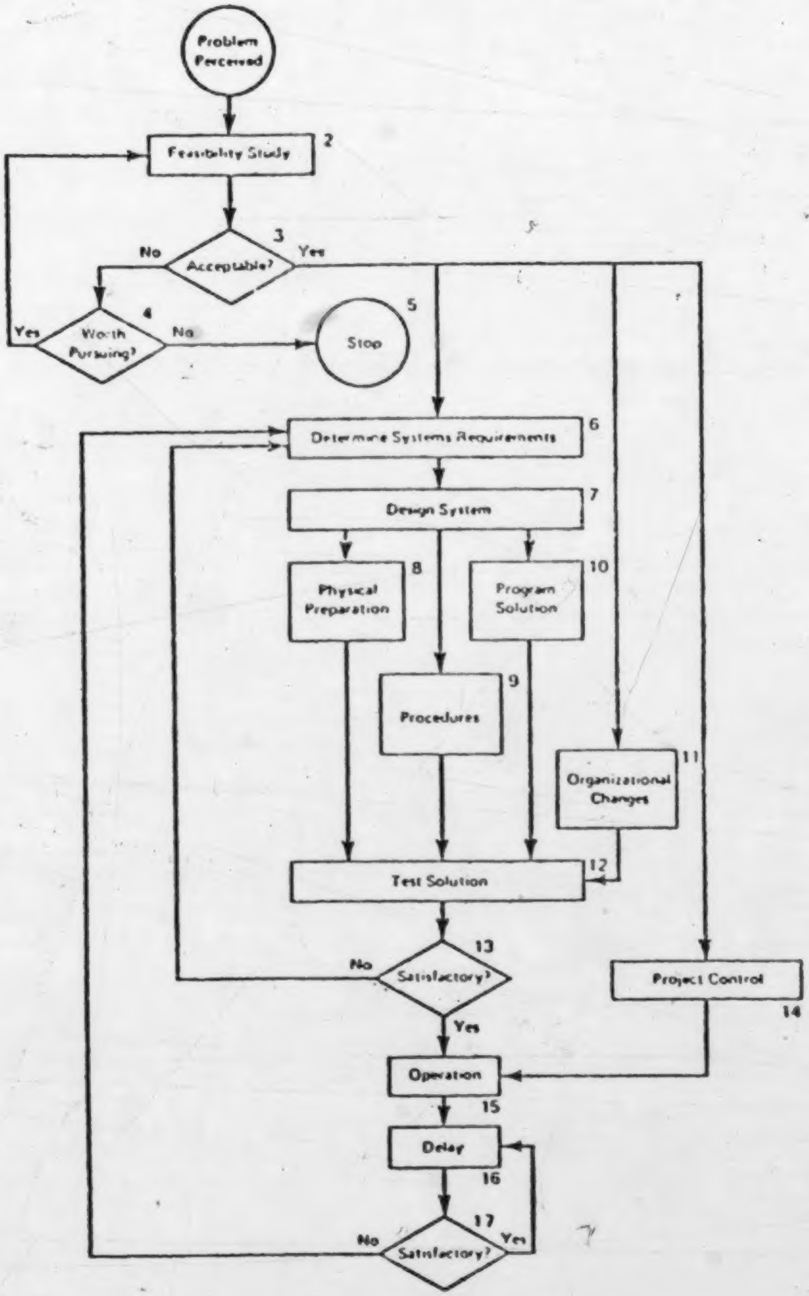
Problem Perceived
Feasibility Study
2
Acceptable?
3
No
Yes
Worth Pursuing?
4
Yes
No
Stop
5
Determine Systems Requirements
6
Design System
7
Physical Preparation
8
Procedures
9
Program Solution
10
Organizational Changes
11
Test Solution
12
Satisfactory?
13
No
Yes
Project Control
14
Operation
15
Delay
16
Satisfactory?
17
No
Yes

Figure 22

Flowchart of System Development and Redevelopment Process

Source: Hussain, Development of Information Systems for Education, p. 186.

existing facilities and personnel, minimizing modifications in present administrative procedures and ensuring that students and staff were involved in its continuous redevelopment.

Conceptual Framework

Objective 3.2: To establish a conceptual framework for systematically generating data.

A review of literature on organizational theory revealed that a community college could be viewed as a system, with specific boundaries, functioning within the community it had been designed to serve. The systems model, described in Chapter IV, developed by Clark, Konrad, Ottley and Ramer was selected as the analytical framework for obtaining information regarding the programmes offered by Vancouver Vocational Institute. (see Figure 23). This model, as shown in Figure 24 and Figure 25, consists of several dimensions, namely:

Stufflebeam's Evaluation Classes

1. Context evaluation
2. Input evaluation
3. Process evaluation
4. Output evaluation

Parson's Functional Subsystems

1. Institutional system
2. Managerial system
3. Technical system

Stufflebeam's Modes of Evaluation

1. Contingency mode
2. Congruency mode

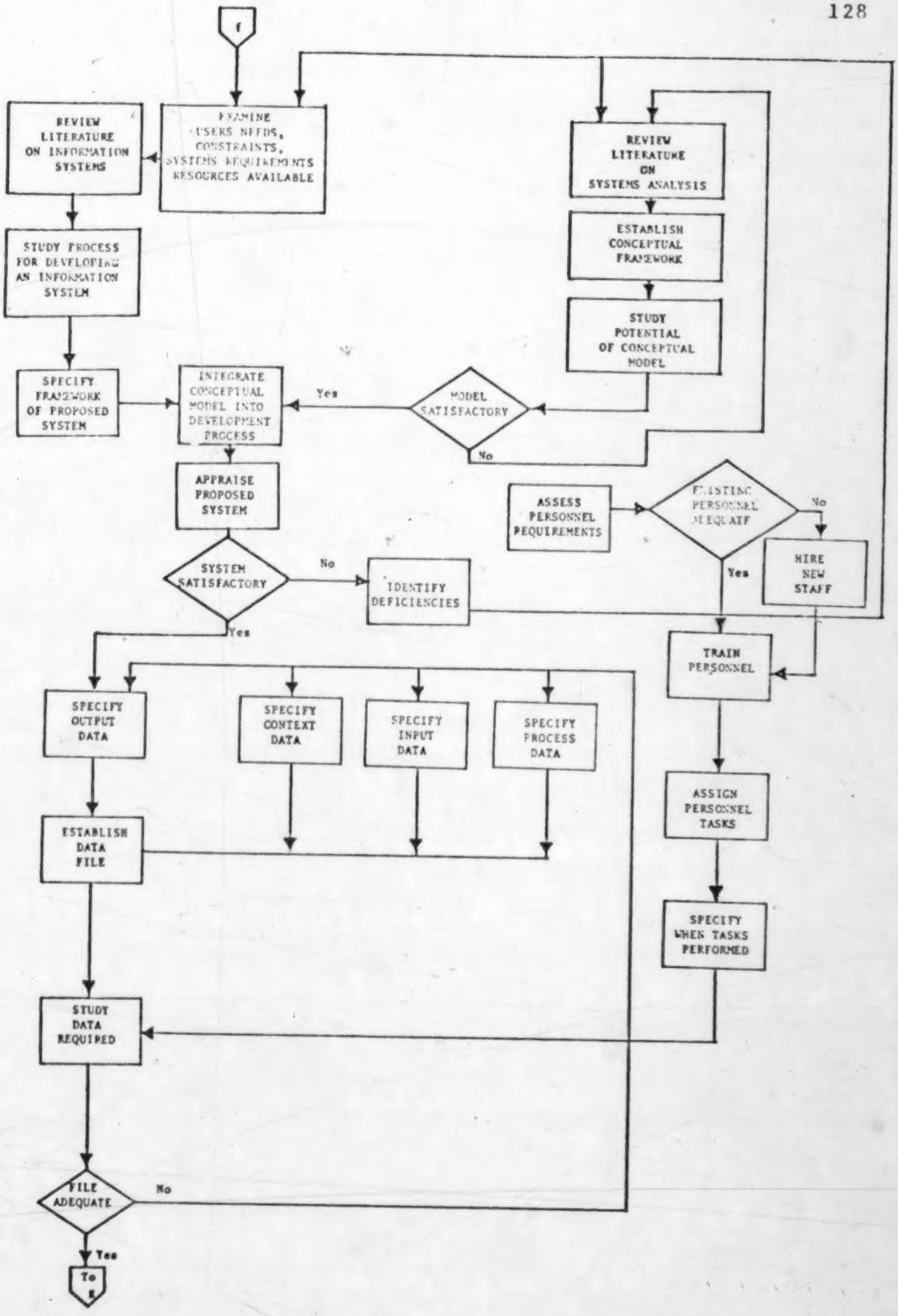
I
EXAMINE USERS NEEDS, CONSTRAINTS, SYSTEMS REQUIREMENTS RESOURCES AVAILABLE
REVIEW LITERATURE ON INFORMATION SYSTEMS
STUDY PROCESS FOR DEVELOPING AN INFORMATION SYSTEM
SPECIFY FRAMEWORK OF PROPOSED SYSTEM
INTEGRATE CONCEPTUAL MODEL INTO DEVELOPMENT PROCESS
REVIEW LITERATURE ON SYSTEMS ANALYSIS
ESTABLISH CONCEPTUAL FRAMEWORK
STUDY POTENTIAL OF CONCEPTUAL MODEL
MODEL SATISFACTORY
Yes
No
APPRAISE PROPOSED SYSTEM
SYSTEM SATISFACTORY
No
IDENTIFY DEFICIENCIES
Yes
ASSESS PERSONNEL REQUIREMENTS
EXISTING PERSONNEL ADEQUATE
No
HIRE NEW STAFF
Yes
TRAIN PERSONNEL
ASSIGN PERSONNEL TASKS
SPECIFY WHEN TASKS PERFORMED
SPECIFY OUTPUT DATA
SPECIFY CONTEXT DATA
SPECIFY INPUT DATA
SPECIFY PROCESS DATA
ESTABLISH DATA FILE
STUDY DATA REQUIRED
FILE ADEQUATE
No
Yes
To 8

Figure 23

System Design

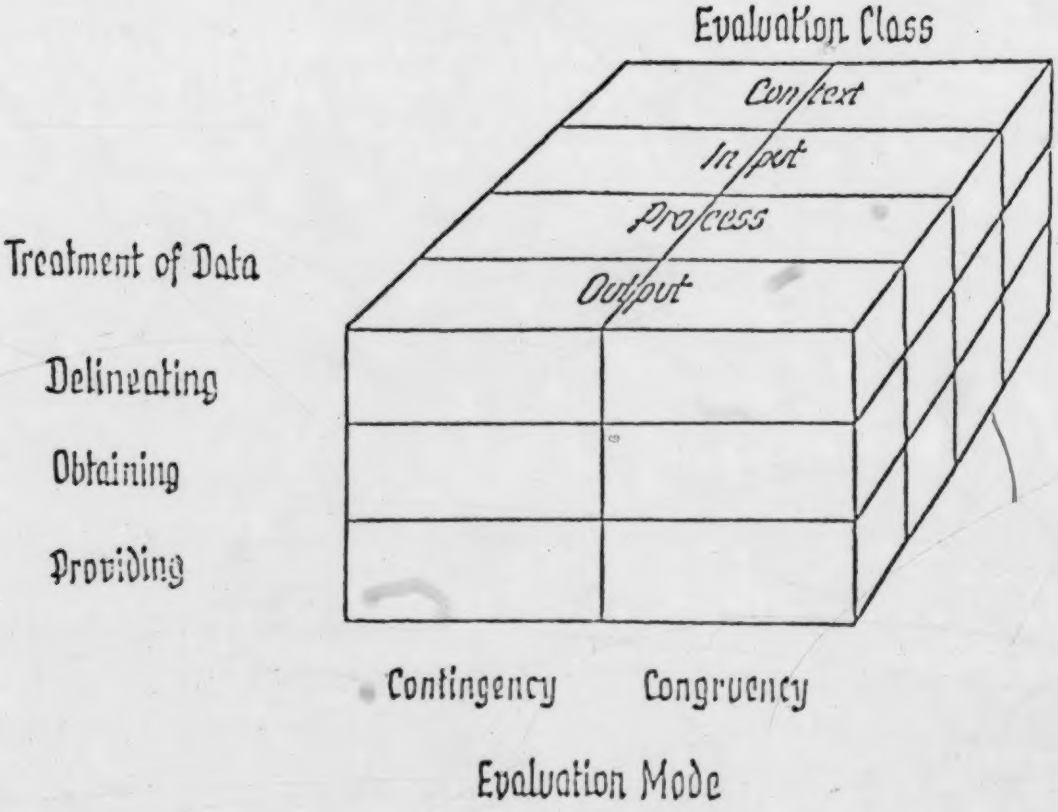
Evaluation Class
Context
Input
Process
Output
Treatment of Data
Delineating
Obtaining
Providing
Contingency
Congruency
Evaluation Mode

Figure 24

The CIPP Model

Source: Clarke, et al., A Systems Approach to Follow-up Studies in Community Colleges, p. 19-22.

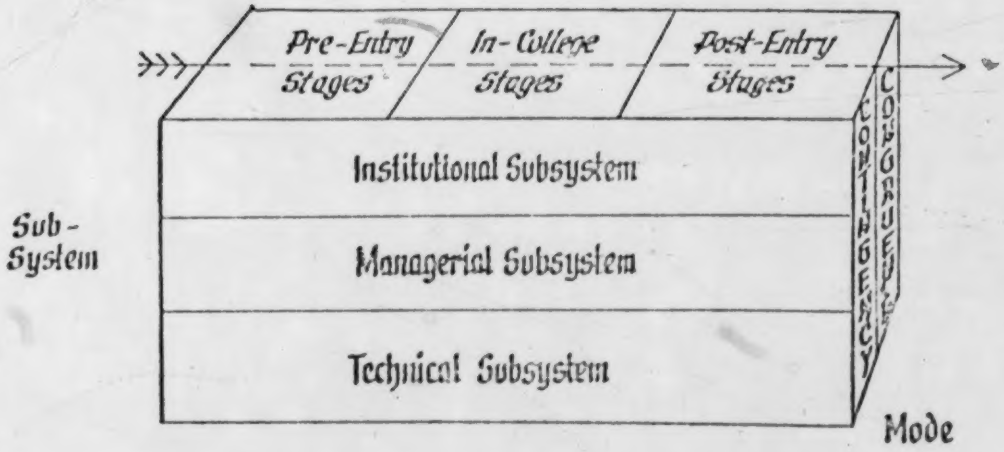
Pre-Entry Stages
In-College Stages
Post-Entry Stages
Institutional Subsystem
Managerial Subsystem
Technical Subsystem
Sub-System
CONTINGENCY
CONGRUENCE
Mode

Figure 25

The Synthetic Model

Source: Clarke, et al., A Systems Approach to Follow-Up Studies in Community Colleges, p. 28.

The framework provided by the 'synthetic model' facilitates investigations being conducted which may vary considerably in scope and comprehensiveness.

Personnel Requirements

> Objective 3.3: To investigate the personnel needs of the programme information system.

In order to pilot test the proposed system, the investigator found it necessary to secure the services of a secretary, research assistant and several support staff, all but one of whom were presently employed by the College. Personnel expenditures were thereby minimized. Furthermore, questionnaires, interview forms, goal inventories, and related material were duplicated and collated for distribution by the staff of the duplicating department of Vancouver Vocational Institute.

The literature reviewed disclosed that in many post-secondary institutions questionnaires, similar to those employed in this investigation, are usually administered by faculty members either at the beginning or end of a class. This practice often results in incomplete sets of data being gathered from students, because instructors are reluctant to become involved in any additional duties. Though the instructors at Vancouver Vocational Institute were generally very cooperative, a number failed to administer a set of questionnaires on a mutually agreed date. Discussion with the individuals concerned disclosed that they had unintentionally forgotten to perform this task. This strongly supported the technique of using temporary staff to administer questionnaires.

Though Vancouver Vocational Institute, similar to most community colleges, offered programmes in key punching and computer science, all the key punching and analysis of data was completed at the University of Alberta. This situation occurred because the investigator was resident in Edmonton while the study was in progress. The graduates', dropouts' and employers' follow-up studies were completed quickly and efficiently because the investigator, during the feasibility study, had secured the services of a secretary for recording the returns and a research assistant for telephoning participants after they had received a questionnaire.

Input-Output Specifications

> Objective 3.4: To study context, input, process, product data elements that should be on file for retrieval or analysis.

When a programme information system is operational, input data are acquired prior to the output being generated. This situation is reversed in the development process because input data cannot be specified until the outputs, desired by the user, have been defined. Therefore, discussion of input-output specifications for the proposed system commences with a study of the output.

Output

The literature reviewed on community colleges, discussions with professional educators, and conferences with the faculty of Vancouver Vocational Institute identified a variety of issues related to vocational programmes warranting investigation and analysis. Due to limited time and resources, the investigator delineated the issues examined to five specific areas. Since these areas were complex, the application of the system was further delineated by analysis focusing on precise objectives which determined the nature of the output, established the data elements on file, and restricted the statistical techniques used.

Input Data

In order to generate the output needed to achieve the specified objectives ,context, input,and process data were gathered in four major phases:

Phase I	Entry	Soon after students commenced attending classes
Phase II	In-College	During students' tenure
Phase III	Exit	Prior to students' graduating
Phase IV	Post-Exit	Several weeks after students graduated

Copies of the instruments employed during these phases can be found in Appendices D, E and F.

The investigator used the four data gathering phases outlined as the basic structure for organizing data elements in a file. Items contained in questionnaires were viewed as data elements, with the instruments functioning as a minor file in major sections defined by the phases. Therefore ,the master file for the system was composed of four major sections containing a series of minor files. Variable data,such as a student's name, address,and employer,were recorded in a separate file, so as to avoid continually changing records.

To facilitate the recording and retrieval of data,a simple eight digit code was adopted that differentiated data as follows:

Code	Description
1	major section (phase)
2	minor file (instrument)
3	status
4	department
5	programme

6 Student's
7 class number
8 check

Space for a check digit, calculated by the Modulus 10 method,[108] was provided to reduce the possibility of data being recorded in the wrong file.

Finally, the master file contains an input-output grid that indicates where data elements were located for generating specific outputs. However, due to the limited application of the system in this investigation, the grid was only partially evolved. Once the system becomes operational, this input-output grid plays an important role in the expansion of the master file by preventing duplication of data, indicating whether sufficient data are available for generating a required output and ensuring that unnecessary data are not gathered.

Computer Facilities

Objective 3.5: To assess the adequacy of computer facilities.

As community colleges have expanded and diversified their programmes to satisfy the growing demand for post-secondary education, their operations have accordingly increased in complexity. In order to cope with the vast quantity of information this expansion has generated, most community colleges have either purchased or rented computer installations. Though many of the systems presently in use may not be highly sophisticated or the most advanced on the market, they are sufficient for a college's normal data processing needs.

Recently, Vancouver Vocational Institute acquired a Hewlett-Packard computer (model HP2000), which the Institution utilizes on a shared basis with the other three campuses of Vancouver City College.

---

[108] Hussain, Development of Information Systems for Education, p. 159.

Though the computer programmer insisted that existing installation was more than adequate for undertaking the kind of analysis proposed in this thesis, a number of faculty members at the University of Alberta doubted whether the Hewlett-Packard computer was capable of accommodating some of the more complex statistical programmes. Since the investigator was resident in Edmonton,all the analysis was completed at the University of Alberta on a 360/67 I.B.M. computer, which resulted in the adequacy of the College installation not being assessed. If Vancouver Vocational Institute or any other community college, interested in using the system designed in this study, finds its existing computer facilities are inadequate, a survey should be undertaken to identify specific deficiencies. Additional hardware would have to be rented or purchased, as shown in Figure 26, if the existing facilities could not be modified to satisfy the institution's needs.

Computer Programmes

Objective 3.6: To obtain computer programmes for analyzing data.

The Hewlett-Packard computer installed at Vancouver Vocational Institute was found to employ BASIC language for processing data which, the computer programmer maintained,was the most suitable for the institution's needs and easy for students in the computer science programme to learn. A review of literature on the Hewlett-Packard computer disclosed that the capabilities of the HP Basic system have been extended by the addition of a Disc Operating System, which enables programmes written in FORTRAN, ALGOL or Assembler language to be employed in analyzing data.

All analysis in this investigation, as noted previously, was completed on the University of Alberta's 360/67 IBM computer, using

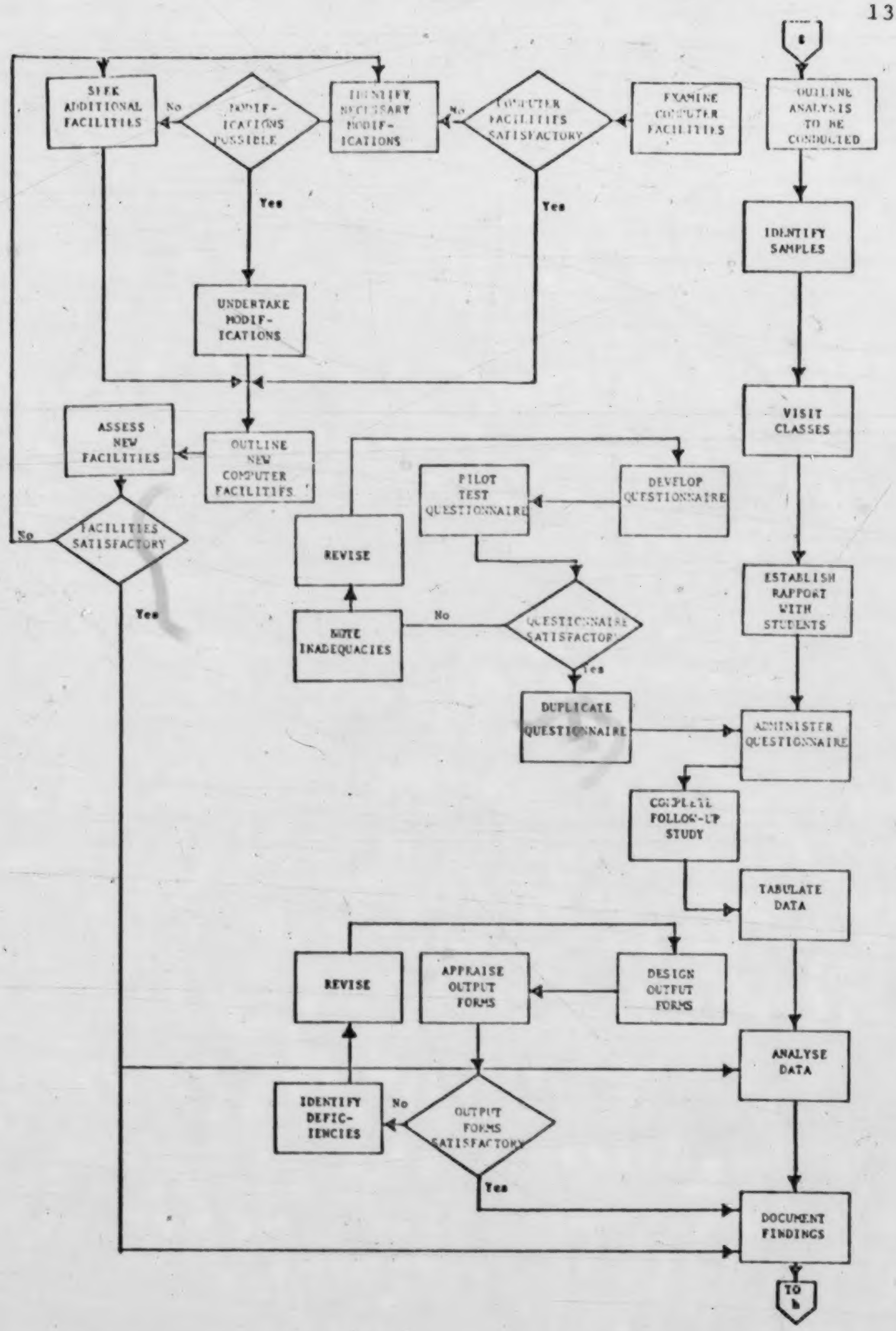
g
SEEK ADDITIONAL FACILITIES
No
MODIF-ICATIONS POSSIBLE
IDENTIFY NECESSARY MODIF-ICATIONS
No
COMPUTER FACILITIES SATISFACTORY
EXAMINE COMPUTER FACILITIES
OUTLINE ANALYSIS TO BE CONDUCTED
Yes
Yes
IDENTIFY SAMPLES
UNDERTAKE MODIF-ICATIONS
VISIT CLASSES
ASSESS NEW FACILITIES
OUTLINE NEW COMPUTER FACILITIES
PILOT TEST QUESTIONNAIRE
DEVELOP QUESTIONNAIRE
No
FACILITIES SATISFACTORY
REVISE
ESTABLISH RAPPORT WITH STUDENTS
Yes
NOTE INADEQUACIES
No
QUESTIONNAIRE SATISFACTORY
Yes
DUPLICATE QUESTIONNAIRE
ADMINISTER QUESTIONNAIRE
COMPLETE FOLLOW-UP STUDY
TABULATE DATA
REVISE
APPRAISE OUTPUT FORMS
DESIGN OUTPUT FORMS
ANALYSE DATA
IDENTIFY DEFIC-IENCIES
No
OUTPUT FORMS SATISFACTORY
Yes
DOCUMENT FINDINGS
TO h

Figure 26

Computer Facilities

mainly statistical programmes written in FORTRAN language developed by the staff of the Division of Educational Research Services. A brief summary of the statistical programmes employed in the study has been presented in Appendix H for reference purposes.

Though a comprehensive selection of statistical programmes were available, the investigator found that, in order to compute and graph mean values for participant's responses, special programmes had to be designed. Also, before the investigator could utilize a statistical programme designed to conduct a two-way analysis of variance, the data on the IBM cards had to be entered in a temporary file on a tape in the Computer Centre, so it could be arranged in the required format for analysis. A description of these programmes can be found in Appendix I.

The statistical programmes were pilot tested with dummy data, as shown in Figure 27, prior to being employed to analyze the data generated by the programme information system. These trials provided examples of the output yielded by programmes, revealed errors in key punching and enabled the investigator to study how the findings might be reported.

Developing Questionnaires

> Objective 3.7: To develop provisional instruments for gathering data.

The questionnaires employed to gather data from students, as previously reported in the methodology, were developed from the literature reviewed on community college students, programme evaluation, and instructional goals (see Figure 28). A multiple-choice format was adopted, in most instances, because the literature indicated that students

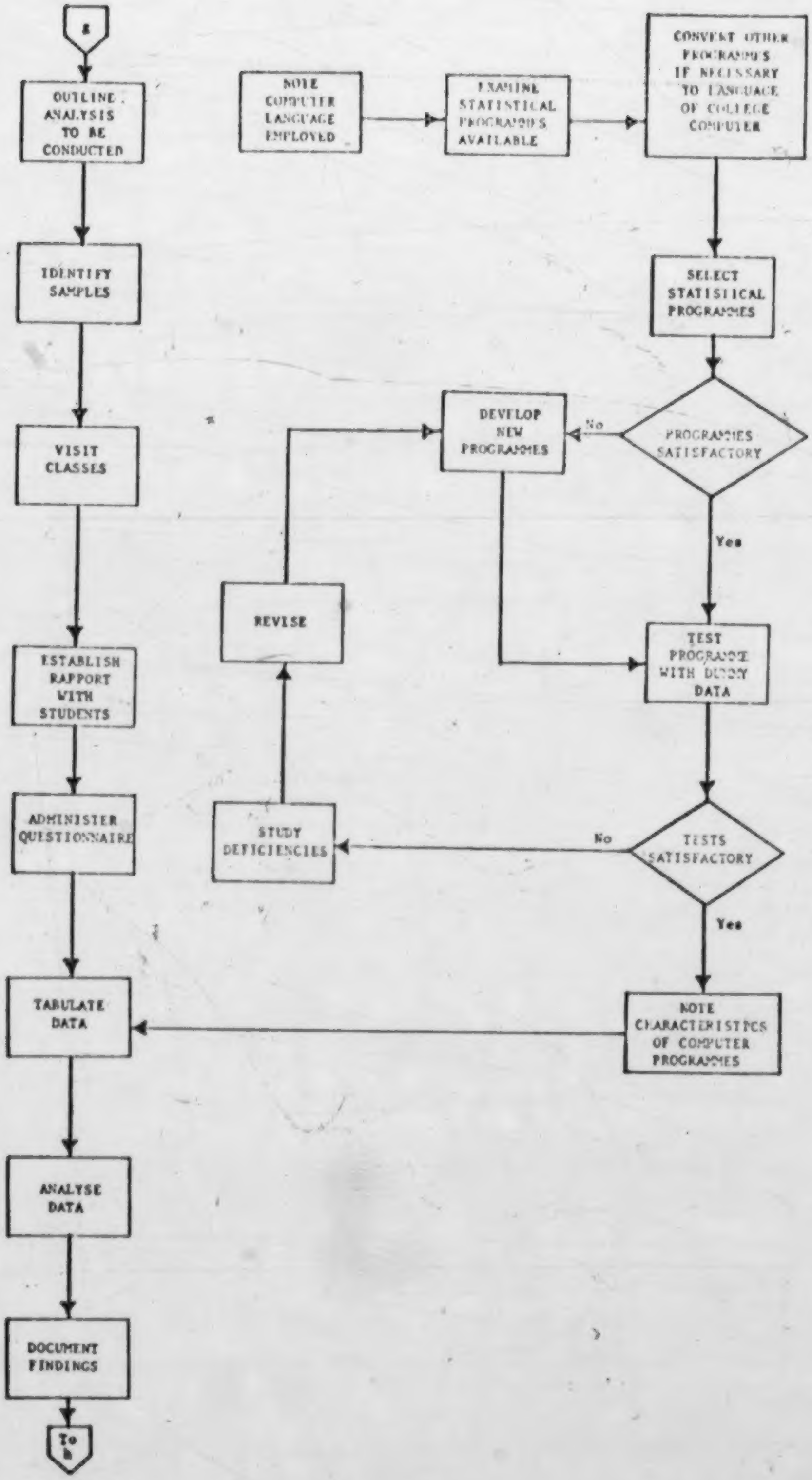
g
OUTLINE ANALYSIS TO BE CONDUCTED
IDENTIFY SAMPLES
VISIT CLASSES
ESTABLISH RAPPORT WITH STUDENTS
ADMINISTER QUESTIONNAIRE
TABULATE DATA
ANALYSE DATA
DOCUMENT FINDINGS
To h
NOTE COMPUTER LANGUAGE EMPLOYED
EXAMINE STATISTICAL PROGRAMMES AVAILABLE
CONVERT OTHER PROGRAMMES IF NECESSARY TO LANGUAGE OF COLLEGE COMPUTER
SELECT STATISTICAL PROGRAMMES
PROGRAMMES SATISFACTORY
No
DEVELOP NEW PROGRAMMES
Yes
TEST PROGRAMME WITH DUMMY DATA
REVISE
STUDY DEFICIENCIES
No
TESTS SATISFACTORY
Yes
NOTE CHARACTERISTICS OF COMPUTER PROGRAMMES

Figure 27

Computer Programmes

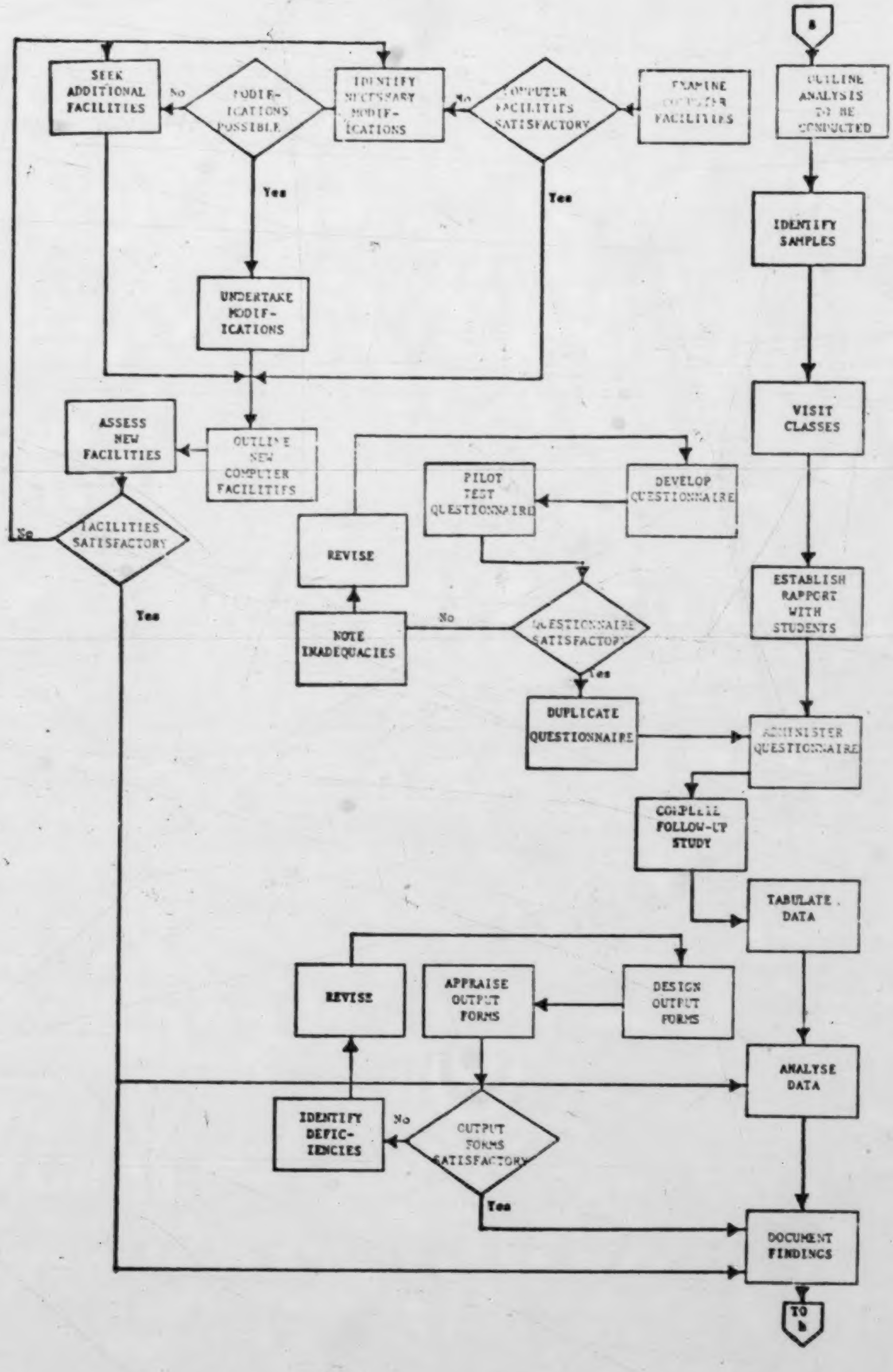
a
OUTLINE ANALYSIS TO BE CONDUCTED
IDENTIFY SAMPLES
VISIT CLASSES
ESTABLISH RAPPORT WITH STUDENTS
ADMINISTER QUESTIONNAIRE
COMPLETE FOLLOW-UP STUDY
TABULATE DATA
ANALYSE DATA
DOCUMENT FINDINGS
TO b
EXAMINE COMPUTER FACILITIES
COMPUTER FACILITIES SATISFACTORY
No
Yes
IDENTIFY NECESSARY MODIF-ICATIONS
MODIF-ICATIONS POSSIBLE
No
Yes
SEEK ADDITIONAL FACILITIES
UNDERTAKE MODIF-ICATIONS
OUTLINE NEW COMPUTER FACILITIES
ASSESS NEW FACILITIES
FACILITIES SATISFACTORY
No
Yes
DEVELOP QUESTIONNAIRE
PILOT TEST QUESTIONNAIRE
QUESTIONNAIRE SATISFACTORY
No
Yes
NOTE INADEQUACIES
REVISE
DUPLICATE QUESTIONNAIRE
DESIGN OUTPUT FORMS
APPRAISE OUTPUT FORMS
OUTPUT FORMS SATISFACTORY
No
Yes
IDENTIFY DEFIC-IENCIES
REVISE

Figure 28

Developing Questionnaires

tend to complete questions of this type more readily, since less time was needed to provide the information requested. Other benefits of this design were that ambiguity of items was reduced, data were gathered more quickly, some degree of consensus was maintained, and responses could be transferred directly on to computer cards.

A major weakness of multiple-choice questionnaires, according to the literature reviewed, is they tend to be rather long; consequently, participants may become bored and randomly respond to final items. In order to prevent this occurring, the investigator kept questionnaires as short as possible. A further criticism of this design is that participants are limited to a set of responses which may not include their experiences and opinions. The investigator overcame this, to some extent, by including open-ended response categories and items.

The literature on follow-up studies indicated that the color of a questionnaire had a significant effect on the response rate of participants. All instruments employed in this investigation were printed on gold paper, since this color made questionnaires distinctive and facilitated the reading of items.

Administering the Questionnaires

> Objective 3.8: To examine procedures for administering questionnaires.

When the questionnaires were administered to the students at Vancouver Vocational Institute, the investigator found that the amount of time needed to them to be completed varied considerably from one group to another. At one end of the continuum, students in the drafting programme provided the data requested in less than twenty minutes, while at the other end students in the waiter/waitress programme required nearly an hour to provide the same information. In the opinion of the investigator, this situation was to some extent due to most of the students in the latter programme being new Canadians, who had difficulty comprehending English. Though the students were highly motivated, conscientious, and sincere in their efforts, limited knowledge of the English language made it difficult for them to complete the questionnaire. Another contributing factor for such variations was differences in academic background.

After the students graduated, they were mailed a follow-up questionnaire to discover whether they had secured the kind of employment for which they had been trained and whether they were satisfied with the training they had received at college. When students were in agreement, their immediate supervisors were telephoned and asked to provide 'feedback' on their new employees and comment on the educational experiences offered by the Institute. A detailed description of these follow-up studies can be found in Appendix G.

Output Forms

Objective 3.9: To consider methods for reporting the findings of analysis.

Frequently, computers print the findings of analysis in a form that many educators find difficult to comprehend, mainly because they have limited experience in interpreting data from computer print-out sheets. Also, administrators often make the mistake of publishing the information, generated by a programme information system, in a series of reports that require several hours to read satisfactorily. This situation can easily be corrected by using a check list, containing the following questions, to design forms:

1. Is the output to be produced readable?
2. Does it have an adequate, unique and meaningful title?

3. Are the different types of reports easily accessible?
4. Are the pages identified?
5. Are the assumptions identified?
6. Is the period for which the data is relevant identified?
7. Is the output dated?
8. In cases of runs on the same data, is the run number identified?
9. Is the output complete?
10. Is it accurate?
11. Is the output easy to store and retrieve?[109]

If answers to these questions are not in the affirmative, then Hussain maintains that "the output design needs further study and additional specifications".[110]

The divisional chairmen stated that many faculty members at Vancouver Vocational Institute, due to their vocational background, lacked both the skills and interest necessary to write brief progress reports. Efforts to resolve this problem, in the past, had achieved minimal success. Therefore, they suggested that, initially, seven people should be hired, on a temporary basis, to write discussion papers. There was general agreement among administrators that these reports would improve public relations by informing the public, employers, and prospective students of the wide variety of activities, programmes, and services offered by the College.

The Data Gathering Process

Objective 3.10: To study the data gathering process of the information system.

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[109] *Ibid.*, p. 257.

[110] *Ibid.*

After the data elements for this investigation had been identified and listed in a file, the programmes previously selected were reviewed with the divisional chairmen, and rapport re-established with the instructors concerned. As outlined in the methodology, data were gathered from students soon after they entered College, prior to terminating their studies, and several weeks after graduation, in accordance with the student flow schema of the 'synthetic model'. Furthermore, the investigator found that, by employing a PERT network, the activities and tasks that had to be completed during a certain phase were easily and quickly identified, which facilitated data being obtained with minimal difficulty. The relationship between data gathering and other phases of the development process have been identified in Figures 26 and 27.

During the first phase of the data gathering process, the investigator visited classrooms where students in the programme sample were being taught, in order to briefly describe again the purpose of the investigator, to outline the various facets of the study and to emphasize the importance of their participation. This initial meeting was the most important stage of the data gathering process, since the rapport established with the students was expected to determine to a considerable extent their commitment and willingness to participate in the study. This expectation was later supported by the high response rates in the follow-up studies of particpants with whom good rapport had been established.

While gathering the first set of data with "Student Questionnaire I", the investigator found that the attitude of an instructor influenced to some degree how students responded to requests for certain information. If an instructor expressed skepticism about the relevance of a specific data element, the students tended to avoid answering the related item on the questionnaire. By encouraging questions and answering them in a simple language, the investigator discovered the anxiety and concerns of students could be considerably reduced.

Most faculty members reacted very positively towards the study, as previously noted in the feasibility study, consequently, there was virtually no resistance to the investigator visiting classes to gather data. The moral support provided by the faculty, in the opinion of the investigator, played a major role in the data gathering being completed smoothly. To maintain the rapport established during the feasibility study, the investigator, whenever possible, met with the faculty on an informal basis to discuss the purpose of the study, examine the benefits that better quality data would yield and identify problems they considered were preventing the College functioning effectively.

The data gathering process was considerably simplified, as previously described in the methodology, by separating the tasks, completed by different groups, into distinct activity paths, a procedure which facilitated the data being gathered on a systematic basis. Since the proposed system when operational would be generating data for a large number of programmes, the investigator recommends that two activity paths be established for each programme, one for the students and the other for their employers. By employing a critical path technique, administrators and faculty members can discover, at a glance, the location of a specific programme in the data gathering process.

V ORGANIZATIONAL CHANGE AND IMPLEMENTATION

Analysis was directed to attaining the fourth primary objective:

> Objective 4.0: To investigate changes in organizational procedures necessary for the information system to become operational.

Organizational Change

> Objective 4.1: To investigate the extent organizational procedures will need to be modified for the information system to become internalized

A major innovation, such as the programme information system being discussed, usually generates considerable resistance to its being introducted because it disturbs the existing system and often requires members of an organization to accept additional responsibilities.

any members of the faculty, during the feasibility study and informal meetings, indicated that they considered the College needed an effective and efficient information system. A small minority maintained that changing the existing system was unnecessary since it had been functioning effectively for the past twenty-five years. In most instances, these individuals, after lengthy discussions, admitted that the present system had been unable to yield data capable of generating strategies for resolving a variety of problems that were preventing the College from functioning effectively.

Since the programme information system, developed in this investigation, was designed to utilize, whenever possible, existing personnel, facilities, and resources, the actual organizational changes required for it to become operational would be minimal. Furthermore, increasing faculty workloads would be avoided by the duplicating of questionnaires, gathering of data, and dissemination of findings being assigned the responsibility of either permanent office personnel or temporary staff hired from the student population.

VI REDEVELOPMENT

Analysis was directed to attaining the fifth primary objective:

Objective 5.0: To establish how continuance of the programme information system might be insured after pilot-testing.

Due to limitations of time and resources, the tasks of implementing, maintaining, and redeveloping the system were never undertaken in this study. However, based on the literature reviewed, conferences with administrators, and discussions with instructors, the investigator was able to identify and suggest practices that would facilitate the information system being integrated into an organization.

In the literature reviewed, it was reported that, in order for an innovation to become stabilized and self-renewing, adequate consideration must be given the following six practices:

1. Continuing reward
2. Practice and routinization
3. Structural integration into the system
4. Continuing evaluation
5. Providing for continuing maintenance
6. Continuing adaptation capability[109]

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[109] Ronald G. Havelock, The Change Agent's Guide to Innovation in Education (Englewood Cliffs: Educational Technology Publications, 1973), p. 134.

These strategies provide users with positive reinforcement, facilitate greater involvement in decision-making, and ensure an innovation satisfies the changing needs of a system. Therefore, to facilitate the internalization of an innovation, emphasis should be focused on the benefits it will yield, since the members of an organization will support an innovation they perceive as being to their advantage. Also, there should be provision for 'feedback' from users so an innovation maintains its flexibility.

In order to facilitate the internalization of the programme information system, a redevelopment team should be formed to ensure the system functions effectively, secure feedback from faculty members on its operation, determine changes in the user's needs and examine instructors' recommendations for improving the system (see Figure 29). This team should be responsible for scheduling conferences so faculty members, from all levels of the organization, may meet on a regular basis to discuss the future expansion of the system, and to comment on its success and suggest improvements.

The redevelopment team, in the investigator's opinion, could be expanded to function as an internal change agency that encourages faculty members to experiment with new techniques, practices and procedures on a trial basis. Also, the information system developed in this study could be expanded to secure feedback on the success of a new programme, disseminate details of different instructional methods being employed in various departments, and generate support for innovations considered to be beneficial either to the institution or the clientele it serves.

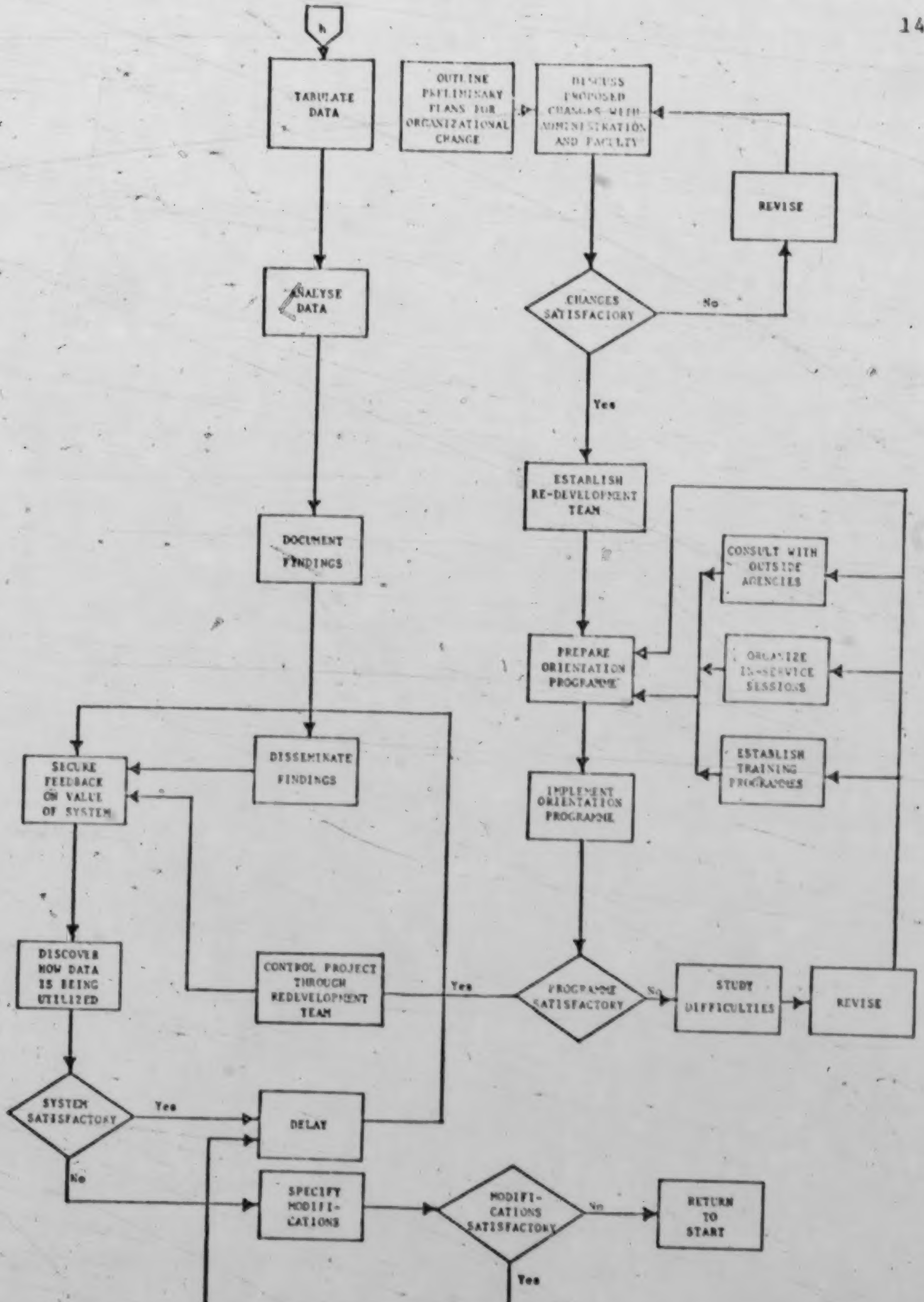
h
TABULATE DATA
OUTLINE PRELIMINARY PLANS FOR ORGANIZATIONAL CHANGE
DISCUSS PROPOSED CHANGES WITH ADMINISTRATION AND FACULTY
REVISE
CHANGES SATISFACTORY
No
Yes
ANALYSE DATA
ESTABLISH RE-DEVELOPMENT TEAM
DOCUMENT FINDINGS
CONSULT WITH OUTSIDE AGENCIES
PREPARE ORIENTATION PROGRAMME
ORGANIZE IN-SERVICE SESSIONS
DISSEMINATE FINDINGS
SECURE FEEDBACK ON VALUE OF SYSTEM
ESTABLISH TRAINING PROGRAMMES
IMPLEMENT ORIENTATION PROGRAMME
DISCOVER HOW DATA IS BEING UTILIZED
CONTROL PROJECT THROUGH REDEVELOPMENT TEAM
Yes
PROGRAMME SATISFACTORY
No
STUDY DIFFICULTIES
REVISE
SYSTEM SATISFACTORY
Yes
DELAY
No
SPECIFY MODIFI-CATIONS
MODIFI-CATIONS SATISFACTORY
No
RETURN TO START
Yes

Figure 29

Organizational Change and Implementation

VII IMPROVING THE SYSTEM

Though the programme information system established in this developmental study has been shown to possess the potential capabilities for generating data needed for community college personnel to adopt a more rational approach to decision-making, during its conception, the investigator discovered that the system could be improved by modifying certain procedures.

1. The gathering, summarizing, and recording of data for analysis on the computer should be completed by temporary personnel hired from the student population. A member of the permanent support staff should be assigned the responsibility of training, supervising, and directing these temporary employees.
2. Typing, duplicating, and collating of instruments should be completed internally, if possible, to minimize expenditures.
3. All instruments employed for surveying students, employers, or faculty members should be coded according to the format outlined in this chapter under the heading 'Input Data'. This coding system facilitates the quick retrieval of specific data and provides participants with anonimity.
4. All instruments utilized in this study should be appraised by a user to determine whether the data being gathered meets their needs. If deficiencies exist, appropriate modifications should be undertaken. Since many community college students are new Canadians, the language used in questionnaire items should be critically examined to ensure that it is comprehensible to participants.

5. All participants should be telephoned, prior to the follow-up study being conducted, to discover their present place of residence, re-establish rapport, and secure their continued involvement in the investigation.
6. Though mailing all questionnaires first-class in a follow-up study increases expenditures, the investigator considers that the benefits exceed the cost, since fewer replies are lost and the return period is considerably shortened. In addition, participants receive questionnaires immediately after being telephoned, which prompts them to provide the information requested.
7. The establishment of a redevelopment team consisting of representatives from all strata of a college is essential for ensuring the continuance of the system and its eventual internalization. Without the support of this team, the investigator perceives that the programme information system would cease to function effectively.
8. When the system becomes operational, members of the redevelopment team should critically examine how findings are to be reported. The involvement of instructors should be encouraged whenever possible.
9. Financial incentives should be employed to encourage faculty members to attend university in order to acquire the knowledge and skills necessary for the system to become integrated into the administrative structure of a college. Furthermore, the theme of inservice sessions and professional development days could be focused on various aspects of the system, so as to expand the pool of faculty members who could be requested to assist in operating the system.

10. Statistical analysis of data, compiling computer programmes, writing reports, disseminating material, and organizing conferences for evaluating the system should be assigned the responsibility of the redevelopment team or temporary subcommittee formed to complete one of these tasks. If the personnel of a college have insufficient expertise, interest, or time, to undertake one of these assignments, members of the redevelopment team should seek the assistance of graduate students attending a local university.

VIII GUIDELINES FOR USERS

This summary has been prepared as a guide for administrators interested in introducing the programme information system, designed in this study, in their institution. Though the system has primarily been designed for community colleges, the developmental process could be employed, in the investigator's opinion, to establish a programme information system for a variety of educational institutions. Since a detailed description of these processes have already been provided, this summary will focus on the principal phases of the five developmental stages.

Feasibility Study

1. Form a small innovation committee representative of the institution's staff, to examine whether introducing this new system into the organization is a necessary, practical, and worthwhile proposition. Arrange with a university to provide consultant services when circumstances warrant external assistance.
2. Direct members of the innovation committee to meet with their colleagues and identify problems which they perceive are preventing the institution from functioning effectively. Isolate and define the major problems,

as perceived by the staff, existing in the institution.

3. Assess the strengths and weaknesses of the information system presently operating in the institution. Compare output of this system with the information needed to examine selected problems and record the deficiencies.
4. Study the benefits and costs of introducing the new system into the institution and determine the resource requirements for a trial application. Compare the economic, organizational, technical, and human constraints, to which the institution is subjected, with the resource requirements of the new system. Document constraints which might adversely effect the system and record any resource deficiencies.
5. Determine the number of temporary staff needed to gather, summarize, and tabulate data. Derive tentative budget estimates for developing and pilot-testing the new information system.
6. Distribute to all departments, a brief report outlining the findings of the feasibility analysis. Direct committee members to attend departmental staff meetings to comment on the report, secure feedback on the findings, and discuss the possibility of developing a new system for the institution.
7. Arrange a conference for senior administrators, divisional chairmen, department heads, and committee members to examine and decide whether to develop and pilot-test a new information system.

Determining User's Needs

8. Form a subcommittee from the innovation team to select, with the assistance of the divisional chairmen and departmental heads, the programmes and classes to be involved in developing a system.

Schedule conferences with instructors and students to inform them of the project, establish rapport, and secure their involvement.

9. Discuss the major problems identified in the feasibility study as being of concern to the staff, and to a greater depth, with the instructors teaching the classes in the sample. Record any special problems associated with the programmes under review and select several for further study.
10. Review the findings of the feasibility analysis and ensure all institutional constraints, and resource requirements are clearly defined. Identify any institutional constraints or resource deficiencies which might adversely effect the proposed system.
11. Establish a tentative schedule for gathering data from participants and draw a detailed network of the activities, tasks, and events involved. Consider how the data gathered will be tabulated, analyzed, reported, and disseminated.
12. Modify the instruments provided in Appendix D to satisfy the institution's needs and code to facilitate storage and retrieval of data (see p. 133).

System Design

13. Hire temporary staff, from the student population, to perform data gathering duties and arrange for appropriate training. Form a subcommittee from the innovation team to control and direct the activities of this group.
14. Determine the adequacy of computer facilities and undertake necessary modifications or acquire additional services if deficiencies exist. Assign a subcommittee the responsibility for defining the scope of analysis and selecting statistical computer programmes. Arrange for consultant services to be provided by a university.

15. Review the procedures, noted in the feasibility study, for summarizing, tabulating, reporting, and disseminating the findings of the analysis. Encourage suggestions from staff members, participating in the project, on the format, language, and length of reports.

Implementing the System

16. Notify, well in advance, both students and instructors when specific data are to be gathered. Arrange conferences prior to administering questionnaires to renew interest in the project, alleviate any anxieties, maintain rapport and emphasize the importance of participant's continuous involvement.
17. Introduce temporary staff to participants and briefly outline the duties they are required to perform. Provide periodic in-service sessions for research assistants to maintain a high level of competence.
18. Conduct the follow-up phase of the data gathering process in accordance with the procedures outlined in Appendix G. Arrange an informal conference with students prior to graduation to explain the purpose of this kind of study.
19. Encourage members of the innovation committee to utilize, whenever possible, existing facilities, resources, and staff to establish the new information system. Organize brain storming sessions, special workshops, and short courses to develop the creativity, confidence, and initiative of committee members. Seek advice from universities, government departments, and private research agencies in completing the different phases of the development process.

Redevelopment

20. Take appropriate action to reduce any resistance to the system that emerges during the duration of the project. Inform all staff in the institution about the progress of the system's development and provide them with any reports which are published on the findings of analysis.

21. Assess whether the new system has provided the information needed by the institution, facilitated certain problems being resolved and resulted in programmes being improved. Identify the deficiencies of the existing system and secure recommendations for introducing improvements.

22. Organize a conference to examine the strengths and weaknesses of the new system. Determine whether the system should be discontinued, continued in its present limited form,or expanded to include more programmes. Distribute to all departments, for general discussion, a report outlining the findings of the evaluation study and the recommendations for the future.

Since the pilot-testing and internalization of the programme information system was beyond the scope of this investigation, the procedures outlined in this section are only tentative guides for the user. The structure of an institution, staff resistance to change, availability of resources,and nature of constraints are but a few factors which shape the design of the system, determine its effectiveness, control the scope of its application,and decide the problems to be studied. However, the development of a system for Vancouver Vocational Institute, the flow-charting of the processes involved in establishing a system,and the brief guide for users, provides sufficient information for an educational institution to design a programme information system for its own specific needs. The involvement of staff from all strata of an institution reduces potential resistance to the system's introduction, ensures the system satisfies user's needs, and provides individuals with an opportunity to personally contribute to directing the future development of an institution.

Though the information system initially designed for an institution may have a number of deficiencies, the developmental approach provides a means of systematically modifying activities, procedures, and structures until the system attains a satisfactory level of performance for the user. This continuous refining feature of the developmental approach also enables the information system to respond, fairly promptly, to the changing data needs of the institution. Finally, the conceptual model, employed as the data generating base of the system, provides an institution with a framework for establishing a comprehensive date file on programmes.

CHAPTER VI

AN APPLICATION OF THE SYSTEM

I INTRODUCTION

The programme information system established in this study was found to be sufficiently generalizable, that with modifications it could be employed to satisfy the information needs of any community college. While developing the system,data were gathered in five areas, namely:

1. Programme goals
2. Learning environment
3. Vocational skills
4. Instructional practices
5. Recommendations for improvement.

These areas had been identified in the literature reviewed and during the preliminary phases of the study as being of concern to professional educators associated with community colleges.

Presented in this chapter, as an illustration of how the system might be effectively utilized, are the findings of analyzing specific sets of data that were gathered in this investigation. Though discussion of the findings is only relevant to the administrators and faculty of Vancouver Vocational Institute, potential users are provided with an illustration of the system's value and versatility. Due to a number of limitations, outlined in Chapter I, analysis mainly focused on studying differences among the occupational divisions of the College. Since a macro approach of this kind obscures important differences among programmes, illustrations of analysis conducted at a divisional level have been presented in the Appendices.

II AN ILLUSTRATION OF THE SYSTEM IN OPERATION

Analysis was directed to attaining the sixth primary objective:

Objective 6.0: To illustrate how the data generated by the programme information system could be utilized to study areas of interest to a college.

Programme Goals

Objective 6.1: To discover whether students, employers and faculty members differ in their perceptions of the emphasis 'that is' and 'should be' placed on a set of programme goals.

Introduction

Members of the three sample groups, who participated in this study, were asked to indicate on an inventory containing the twenty goal statements reported in Table 4:

1. The degree of importance that 'should be' placed on each goal;
2. The degree of importance that 'is' actually being placed on each goal.

A five-point scale ranging from five (of extremely high importance) to one (of no importance) was provided for this evaluation. Mean scores were computed for each goal to determine the magnitude of the discrepancy between what 'should be' and 'is', identify the goals participants perceived were the most important and establish whether the three groups were in agreement.

Present Goals

Findings. The data in Table 5 suggest that the students were in general consensus as to which of the twenty specified programme goals were presently being emphasized the most by the College. The goals

Table 4

Programme Goals

No.	Goal
1	Improving Mental Health
2	Developing Special Aptitudes
3	Improving Inter-Personal Relationships
4	Raising Level of Social Status
5	Developing Social Graces
6	Developing Creativity
7	Raising the Level of Education Achievement
8	Improving Self Concept
9	Increasing Basic Skills
10	Increasing Social Recognition
11	Assisting in the Choice of a Major Career
12	Influencing Basic Beliefs
13	Assisting in the Choice of an Avocation
14	Raising Level of Income
15	Stimulating Interest in New Areas
16	Increasing Drive Toward Goal
17	Increasing Problem-Solving Ability
18	Instilling a Sense of Citizenship
19	Improving Critical Thinking
20	Raising the Level of Vocational Achievement

Table 5

Mean Scores, Standard Deviations and Rank Order of Present Importance of Goals as Perceived by Students
N=111

	Present Importance		
Goal No.	Mean Score	Standard Deviation	Rank Order
20	3.72	0.93	1.0
7	3.54	1.00	2.0
14	3.39	1.04	3.0
8	3.25	1.07	4.0
19	3.23	0.91	5.0
4	3.14	1.01	6.0
16	3.10	1.04	7.0
17	3.06	1.06	8.0
6	3.00	1.05	9.5
9	3.00	0.98	9.5
3	2.86	1.09	11.0
18	2.85	1.03	12.0
15	2.84	0.99	13.0
11	2.73	1.18	14.0
10	2.68	1.04	15.0
1	2.63	0.92	16.0
2	2.60	1.07	17.0
5	2.47	0.98	18.0
12	1.95	1.01	19.0
13	1.77	0.94	20.0

assigned the highest priority, in the students' opinion, were:

#20 Raising the level of vocational achievement

#7 Raising the level of educational achievement

#14 Raising the level of income

#8 Improving self concept

#19 Improving critical thinking.

The employers' rankings, according to the data in Table 6, were in concordance with those of the students. The only difference between their ordering, of the high priority goals, was that goal #8 'improving self concept' was perceived to be of less importance by the former than goal #10 'increasing social recognition'. Though the faculty ranked goals #20, #7 and #14 as being very important to the College, they differed from the students and employers by ranking high goal #3 'improving inter-personal relations' and goal #17 'increasing problem solving ability' (see Table 7).

At the other end of the continuum, the students perceived that minimal emphasis was presently being placed, by the College, on the following programme goals:

#1 Improving mental health

#5 Developing social graces

#18 Instilling a sense of citizenship

#12 Influencing basic beliefs

#13 Assisting in the choice of avocation.

A study of the data in Table 5 and Table 6 reveals that the students' and employers' rankings were again similar. Of the five goals ranked lowest by the two groups, the only difference was that the employers

Table 6

Mean Scores, Standard Deviations and Rank Order of Present Importance of Programme Goals as Perceived by Employers
N=56

Present Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	3.36	0.86	1.0
7	3.34	0.90	2.0
14	3.30	0.74	3.0
10	3.07	1.01	4.0
19	3.05	0.96	5.0
8	3.02	1.05	6.0
15	2.88	0.94	7.0
2	2.86	0.82	10.0
17	2.86	0.82	10.0
9	2.86	0.94	10.0
4	2.84	1.01	11.5
6	2.84	0.93	11.5
16	2.79	0.78	13.0
3	2.71	0.85	14.0
11	2.70	0.97	15.0
1	2.45	0.71	16.0
5	2.36	0.90	17.0
18	2.30	0.89	18.0
12	2.21	0.97	19.0
13	2.09	0.84	20.0

Table 7

Mean Scores, Standard Deviation and Rank Order of Present Importance of Programme Goals as Perceived by Faculty Members
N=25

Present Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	4.16	0.75	1.0
7	3.68	0.90	2.0
17	3.48	0.87	3.0
14	3.44	0.96	4.0
3	3.32	0.95	5.5
16	3.32	0.75	5.5
19	3.28	0.89	7.0
8	3.16	0.75	8.0
11	3.12	0.88	9.0
15	3.00	0.82	10.0
4	2.96	0.84	11.0
1	2.88	0.78	12.0
2	2.84	1.07	13.0
6	2.76	1.16	14.5
9	2.76	1.05	14.5
5	2.52	1.08	16.5
10	2.52	0.92	16.5
18	2.24	0.97	18.0
13	1.52	0.71	19.0
12	1.40	0.58	20.0

perceived the College placed less emphasis on goal #18 'instilling a sense of citizenship' than the students. The data in Table 7 indicate that the faculty's perceptions, as to which goals were emphasized the least by the College, differed, to some extent, from those of the students and employers.

The Spearman Correlation Coefficients (Table 8) computed from the participants' rankings of the programme goals were of a high magnitude and significant at the 0.05 level. These statistics substantiated some of the inferences made from studying the raw data.

Discussion. The students, employers, and faculty appeared to have common perceptions concerning the programme goal priorities of Vancouver Vocational Institute. According to the findings, participants reported that considerable emphasis was being given to assisting students improve their general education, acquire certain vocational skills and improve their level of income. Similarly, members of the three groups perceived minimal emphasis was being given, by the College, to the social aspects of education. Though there appeared to be some differences among groups in their ranking of the programme goals, statistical analysis indicated that overall the students, employers, and faculty were agreed as to the degree of importance that 'is' being placed on the twenty programme goals by the College.

Table 8

Spearman Correlation Coefficients for Present Importance of Programme Goals as Rank Ordered By Students, Employers and Faculty Members

Group	Students	Employers	Faculty Members
Students	1.000		
Employers	0.750	1.000	
Faculty Members	0.800	0.665	1.000

$\rho > 0.377$ (0.05 level of significance)

Preferred Goals

Findings. Participants were asked not only to report what emphasis they perceived the set of programme goals were given by the College, but also to indicate what emphasis they considered should be placed on these goals. The data, presented in Table 9, reveal that the five preferred goals the students considered to be of greatest importance were:

#20 Raising the level of vocational achievement
#7 Raising the level of educational achievement
#11 Assisting in the choice of a major career
#14 Raising level of income
#8 Improving self concept

In previous analysis, it was reported that the students perceived the College was placing considerable emphasis on three of these goals, which suggests that, to some extent, Vancouver Vocational Institute was able to satisfy their needs.

The employers, as shown in Table 10, considered only two of the preferred programme goals ranked high by the students as being of major importance, namely: (1) 'raising the level of vocational achievement'; and (2) 'assisting in the choice of a major career'. In contrast to the students, the employers maintained that high priority should be given to:

#17 Increasing problem solving ability
#19 Improving critical thinking
#6 Developing creativity

A study of Table 11 reveals that the faculty ranked all but one of

Table 9

Mean Scores, Standard Deviations and Rank Order of Preferred Importance of Programme Goals as Perceived by Students
N=111

Preferred Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	4.40	0.65	1.0
7	4.32	0.66	2.0
11	4.12	0.89	3.0
14	4.08	0.83	4.0
8	4.06	0.96	5.5
6	4.06	0.75	5.5
19	4.04	0.79	7.0
16	3.99	0.87	8.0
17	3.88	0.78	9.0
15	3.81	0.85	10.0
1	3.77	0.75	11.5
9	3.77	0.90	11.5
3	3.71	0.85	13.0
2	3.51	0.96	14.0
18	3.47	1.03	15.0
5	3.44	0.99	16.0
4	3.42	1.11	17.0
10	3.27	1.05	18.0
13	2.39	1.07	19.0
12	2.17	1.21	20.0

Table 10

Mean Scores, Standard Deviations and Rank Order of Preferred Importance of Programme Goals as Perceived by Employers
N=56

Preferred Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	4.21	0.65	1.0
17	4.13	0.60	2.0
19	4.11	0.65	3.0
11	4.07	0.63	4.0
6	4.02	0.80	6.0
7	4.02	0.75	6.0
9	4.02	0.73	6.0
1	3.96	0.63	8.0
15	3.95	0.70	9.0
16	3.93	0.85	10.0
2	3.86	0.82	11.0
3	3.79	0.85	12.5
14	3.79	0.71	12.5
8	3.73	0.82	14.0
18	3.41	0.65	15.0
5	3.30	0.91	16.0
4	3.30	0.91	17.0
10	3.18	1.03	18.0
13	2.70	1.01	19.0
12	2.61	1.04	20.0

Table 11

Mean Scores, Standard Deviations and Rank Order of Preferred Importance of Programme Goals as Perceived by Faculty Members
N=25

Preferred Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	4.60	0.50	1.0
7	4.40	0.50	2.0
17	4.16	0.55	3.5
19	4.16	0.62	3.5
11	4.08	0.76	5.5
16	4.08	0.49	5.5
3	4.00	0.76	7.0
8	3.92	0.57	8.5
14	3.92	0.91	8.5
15	3.84	0.69	10.0
1	3.60	0.65	11.5
9	3.60	1.00	11.5
2	3.56	0.82	13.0
6	3.44	0.82	14.0
4	3.28	1.02	15.0
5	3.16	1.03	16.0
10	3.12	1.01	17.0
18	3.04	1.14	18.0
13	2.00	1.08	19.0
12	1.72	0.79	20.0

the top five preferred programme goals in the same order as the employers; the difference being that goal #6 'developing creativity' was considered to be more important by the employers than goal #16 'increasing drive toward goals'.

At the other end of the continuum, the students ranked of low importance the following five preferred goals:

#5 Developing social graces
#4 Raising level of social status
#10 Increasing social recognition
#13 Assisting in the choice of an avocation
#12 Influencing basic beliefs.

The employers, as shown in Table 10, ranked these five programme goals in the same order of preference, which implies there was a high level of consensus between these two groups. Though the faculty ranked four of these five goals as being of low priority, the order differed from that of the other two groups. The data in Table 11 show that, in contrast to the students and employers, the faculty considered goal #18 'instilling a sense of citizenship' to be of low priority.

The perception of the three groups, based on their rankings of the most and least preferred goals, appeared to differ. Statistical analysis, however, revealed that a high level of consensus existed among the groups in terms of their total rankings. All the Spearman Correlation Coefficients in Table 12, computed from the ranked data, are fairly high in magnitude and significant at the 0.05 level.

Table 12

Spearman Correlation Coefficients for Preferred Importance of Programme Goals as Rank Ordered by Students, Employers and Faculty Members

Group	Students	Employers	Faculty Members
Students	1.000		
Employers	0.626	1.000	
Faculty Members	0.789	0.665	1.000

$\rho > 0.377$ (0.05 level of significance)

Discussion. The students, employers, and faculty reported that Vancouver Vocational Institute should be assigning high priority to programme goals concerning vocational achievement, educational achievement, career selection, and income improvement. These goals were identified in previous analysis as being the major focus of educational activities at the College. Therefore, it was concluded that the present programme goal priorities of the Institute were congruent with the preferences of its clientele. Similarly, the three groups ranked low the social goals of education, which again was congruent with their perceptions of the College's priorities. It was inferred from these findings that the students, employers, and faculty ranked the present vocational orientation of Vancouver Vocational Institute to be maintained. Statistical analysis confirmed that the three groups exhibited common judgments.

Goal Congruence

Findings. By comparing how students ranked the present and preferred importance of the twenty programme goals, it was possible to determine the extent to which their preferences were in agreement with the perceived priorities of the College. Statistical analysis of the ranked data yielded a Spearman Correlation Coefficient of 0.74 which was significant at the 0.05 level. Graphing the mean scores assigned the programme goals by the students revealed that they perceived there was a discrepancy between the present and preferred importance of the goals (see Figure 30). A test of difference between present and preferred mean scores of importance for each goal revealed, as shown in Table 13, that a significant difference existed in all cases.

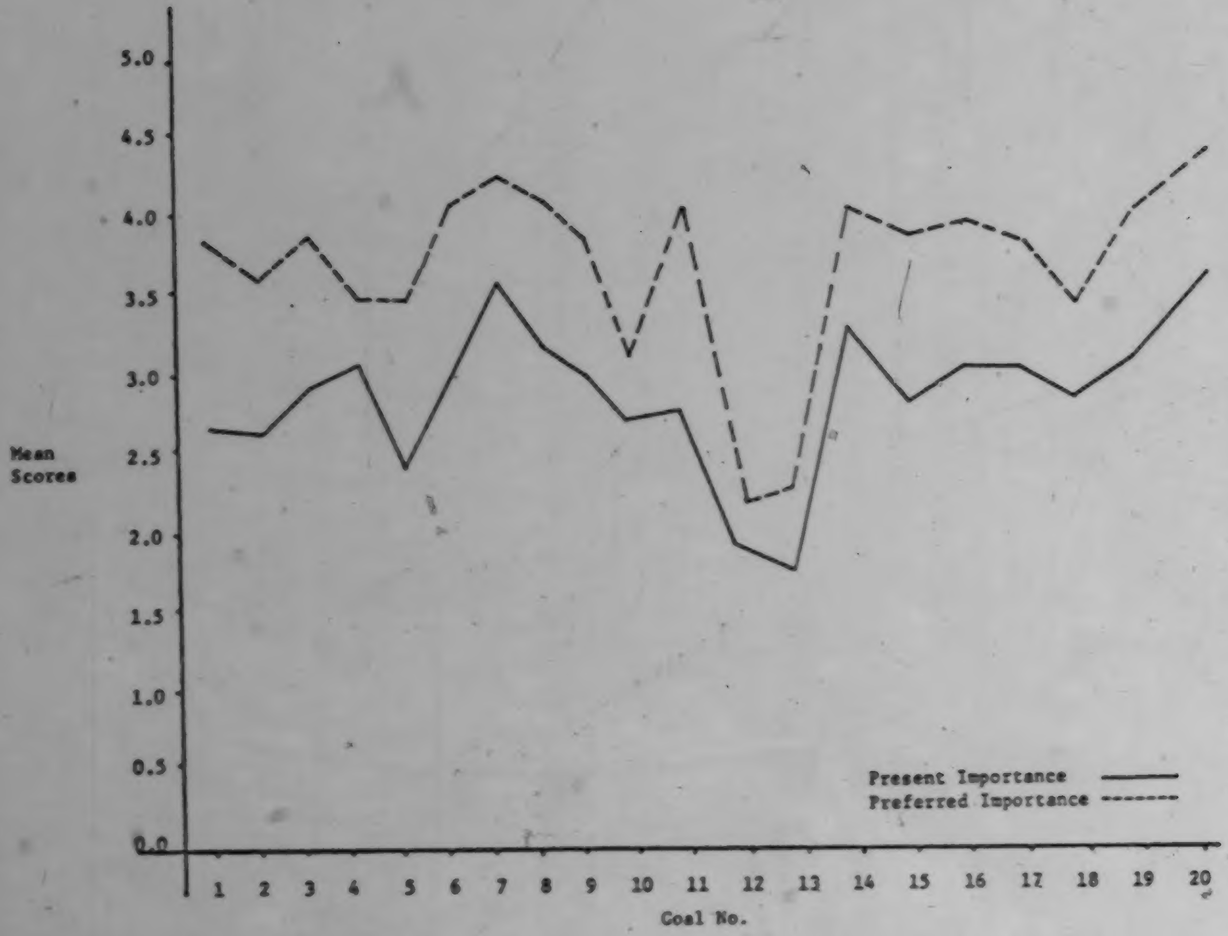

Figure 30

Graphical Presentation of Mean Scores of Present and Preferred Importance of Programme Goals as Perceived by Students

Table 13

Summary of the Tests of Difference Between Present and Preferred Importance of Programme Goals as Perceived by Students

Goal No.	1	2	3	4	5	6	7	8	9	10
Mean Score										
present	2.630	2.600	2.860	3.140	2.470	3.000	3.540	3.250	3.000	2.680
preferred	3.770	3.510	3.710	3.420	3.440	4.060	4.320	4.060	3.770	3.270
t value	11.404	8.477	7.531	2.261	8.810	10.442	7.708	7.827	7.469	5.490
p value	0.000	0.000	0.000	0.026	0.000	0.000	0.000	0.000	0.000	0.000

Goal No.	11	12	13	14	15	16	17	18	19	20
Mean Score										
present	2.730	1.950	1.770	3.390	2.840	3.100	3.060	2.850	3.230	3.720
preferred	4.120	2.170	2.390	4.080	3.810	3.990	3.880	3.470	4.040	4.400
t value	11.171	2.829	6.732	6.895	10.115	8.687	8.397	6.668	7.904	6.983
p level	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

$p < 0.05$

Statistical analysis of how employers ranked the preferred and present importance of the twenty programme goals yielded a correlation coefficient of 0.46. Though this statistic was significant at the 0.05 level, the low magnitude of the coefficient suggests that there was a low level of agreement between the employers' preferred priorities and their perceptions of the College's present priorities. Graphing the employers' present and preferred mean scores for each goal (Figure 31) revealed that there was a substantial difference between their responses in most instances. A test of difference between what the employers perceived 'should be' and 'is' disclosed, as shown in Table 14, that a significant discrepancy existed for all but two of the goals at the 0.05 level.

Comparing the order in which faculty members ranked the preferred and present importance of programme goals, yielded a correlation coefficient which was significant at the 0.05 level. The graphs of the faculty's present and preferred mean score for each goal (Figure 32) indicated that, though their priorities were virtually identical to those of the College, they considered there was some discrepancy, in many instances, between what 'is' and what 'should be'. A test of difference, as shown by the statistics in Table 15, revealed that the discrepancy between present and preferred mean scores of the faculty was significant for all the programme goals.

Discussion. The graphed responses of the students, employers, and faculty disclosed that all three groups perceived that more emphasis should be given to the twenty specified goals. Though the investigator anticipated that the students and employers would be dissatisfied with

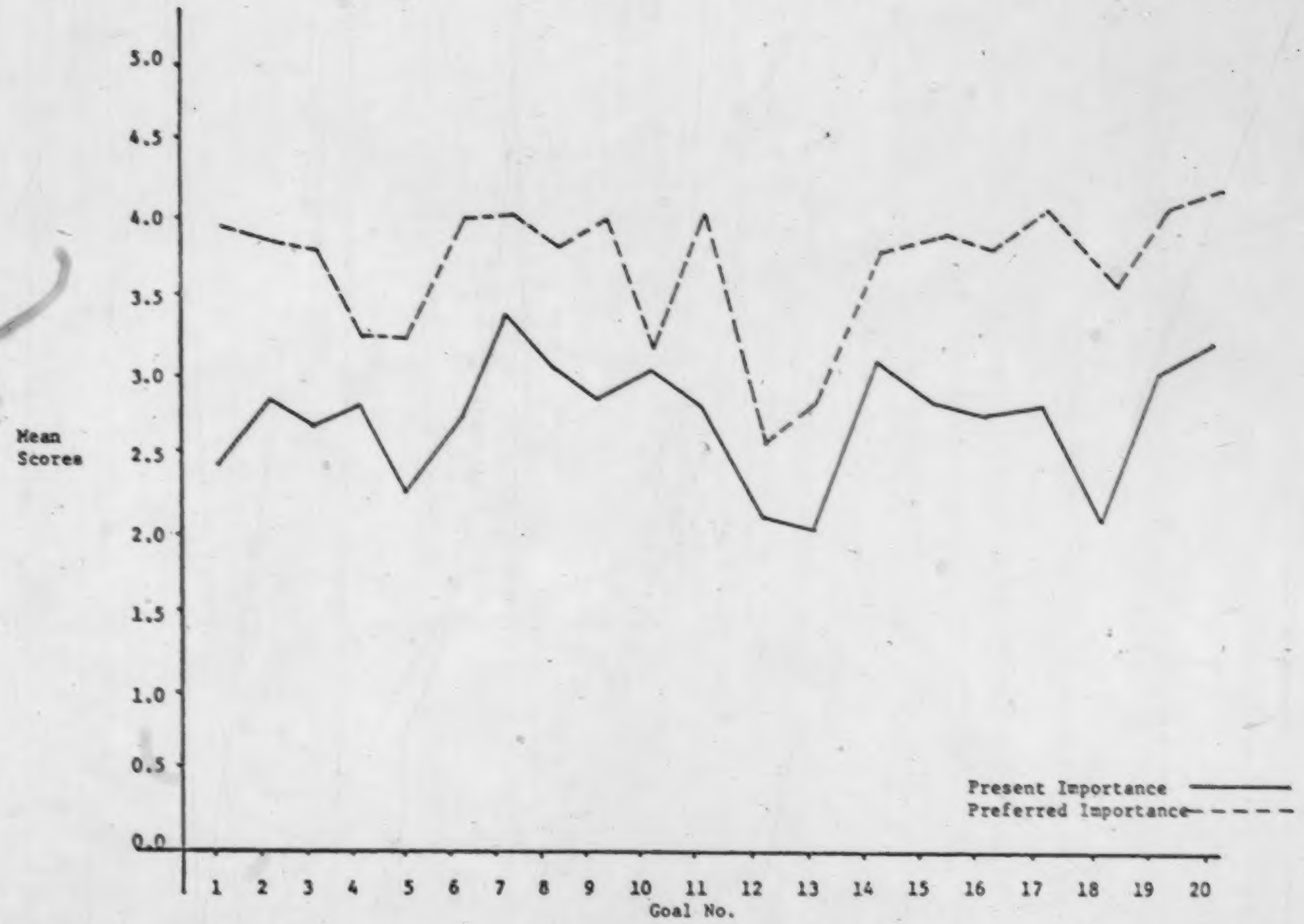

Figure 31

Graphical Presentation of Mean Scores of Present and Preferred Importance of Programme Goals as Perceived by Employers

Table 14

Summary of the Tests of Difference Between Present and Preferred Importance of Programme Goals as Perceived by Employers

Goal No.	1	2	3	4	5	6	7	8	9	10
Mean Score										
present	2.450	2.860	2.710	2.840	2.360	2.840	3.340	3.020	2.860	3.070
preferred	3.960	3.860	3.790	3.300	3.300	4.020	4.020	3.730	4.020	3.180
t value	13.001	7.849	7.827	1.613	6.241	7.396	4.774	4.101	7.315	0.651
p level	0.000	0.000	0.000	0.113	0.000	0.000	0.000	0.000	0.000	0.518

Goal No.	11	12	13	14	15	16	17	18	19	20
Mean Score										
present	2.700	2.210	2.090	3.300	2.880	2.790	2.860	2.300	3.050	3.360
preferred	4.070	2.610	2.700	3.790	3.950	3.930	4.130	3.410	4.110	4.210
t value	9.178	2.783	3.831	3.154	7.569	7.535	8.597	8.147	6.585	6.309
p level	0.000	0.007	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000

$p < 0.05$

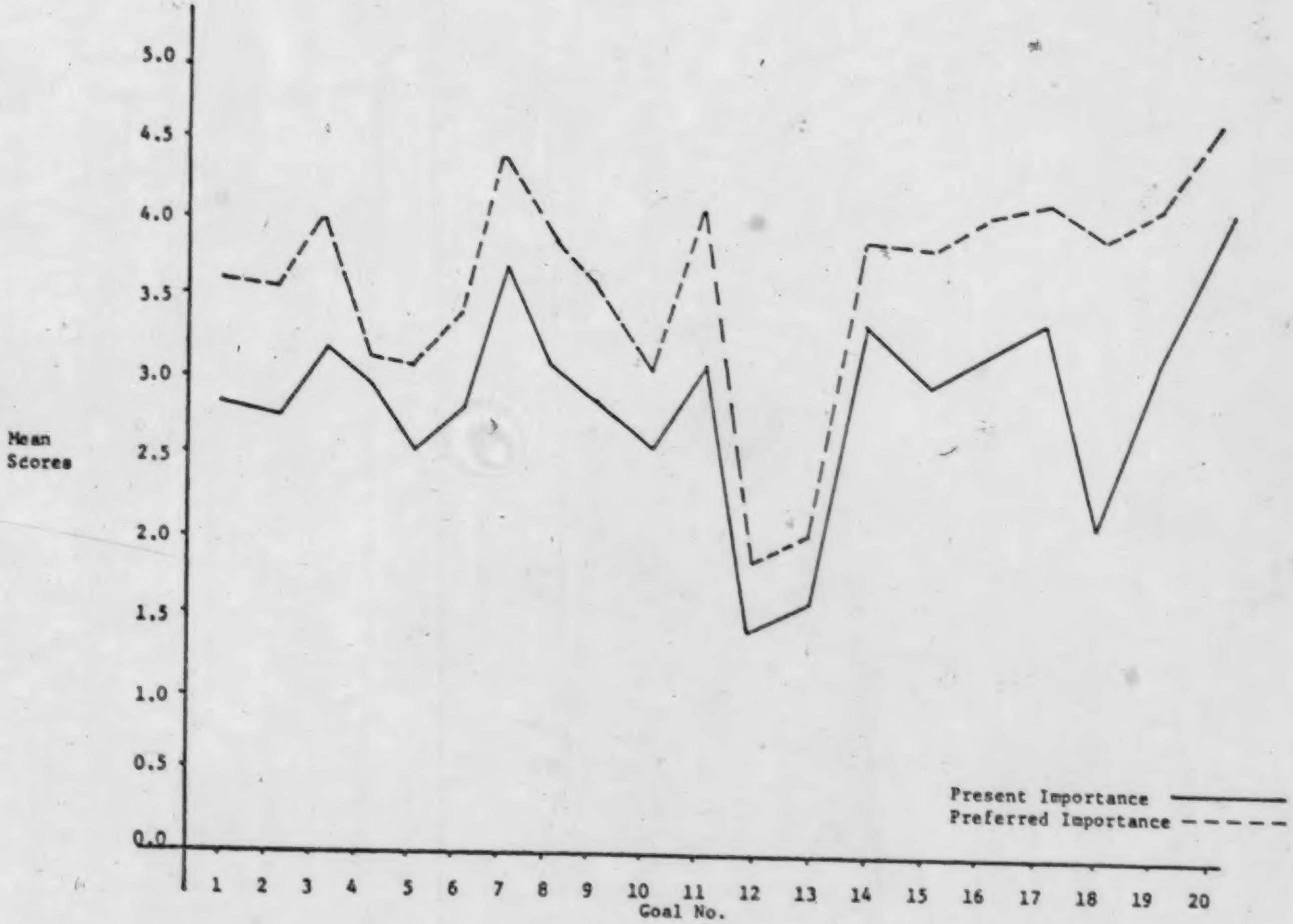

Figure 32

Graphical Presentation of Mean Scores of Present and Preferred Importance of Programme Goals as Perceived by Faculty Members

Table 15

Summary of the Tests of Difference Between Present and Preferred Importance of Programme Goals as Perceived by Faculty Members

Goal No.	1	2	3	4	5	6	7	8	9	10
Mean Score										
present	2.880	2.840	3.320	2.960	2.520	2.760	3.680	3.160	2.760	2.520
preferred	3.600	3.560	4.000	3.280	3.160	3.440	4.400	3.920	3.600	3.120
t value	4.042	5.308	3.302	2.317	3.089	3.180	3.345	4.106	4.257	4.648
p level	0.000	0.000	0.003	0.029	0.005	0.004	0.001	0.000	0.000	0.000

Goal No.	11	12	13	14	15	16	17	18	19	20
Mean Score										
present	3.120	1.400	1.520	3.440	3.000	3.320	3.480	2.240	3.280	4.160
preferred	4.080	1.720	2.000	3.920	3.840	4.080	4.160	3.040	4.160	4.600
t value	4.707	2.874	3.116	2.493	5.269	4.879	3.440	3.843	4.176	2.864
p level	0.000	0.008	0.005	0.020	0.000	0.000	0.002	0.001	0.000	0.009

$p < 0.05$

existing conditions, the size of the discrepancy they reported, in many instances, was unexpected. Furthermore, except for two goals, the difference between what the clientele of the College perceived 'should be' and 'is' was significant. The general conclusion derived from these findings was that the students and employers considered certain areas of existing programme curricula warranted revision. Though the faculty also reported a discrepancy between what 'is' and what 'should be', the magnitude of the difference was much smaller than that of the clientele. Therefore it appeared that the faculty were less dissatisfied with existing conditions than either the students or employers.

Group Perceptions

Findings. The graphs generated in the study of goal congruence suggested that the perceptions of the three groups differed with respect to the emphasis that the College 'should be' placing on the twenty goals and the emphasis that 'is' actually being assigned. The investigator considered this issue warranted further study.

The present mean scores assigned the twenty goals by the students, employers and faculty, reported in Tables 5, 6 and 7, were graphed (see Figure 33). Fluctuations in the graphs suggested that the students, employers,and faculty, as a group, perceived each of the specified programme goals were being given different emphasis by the College. Also the variations in the line graphs inferred that the three groups differed in their assessment of the present importance that was being assigned the set of goals. The mean scores presented in Table 16 and Table 17 confirmed these observations. A two-way analysis of variance was undertaken to examine the nature of these relationships.

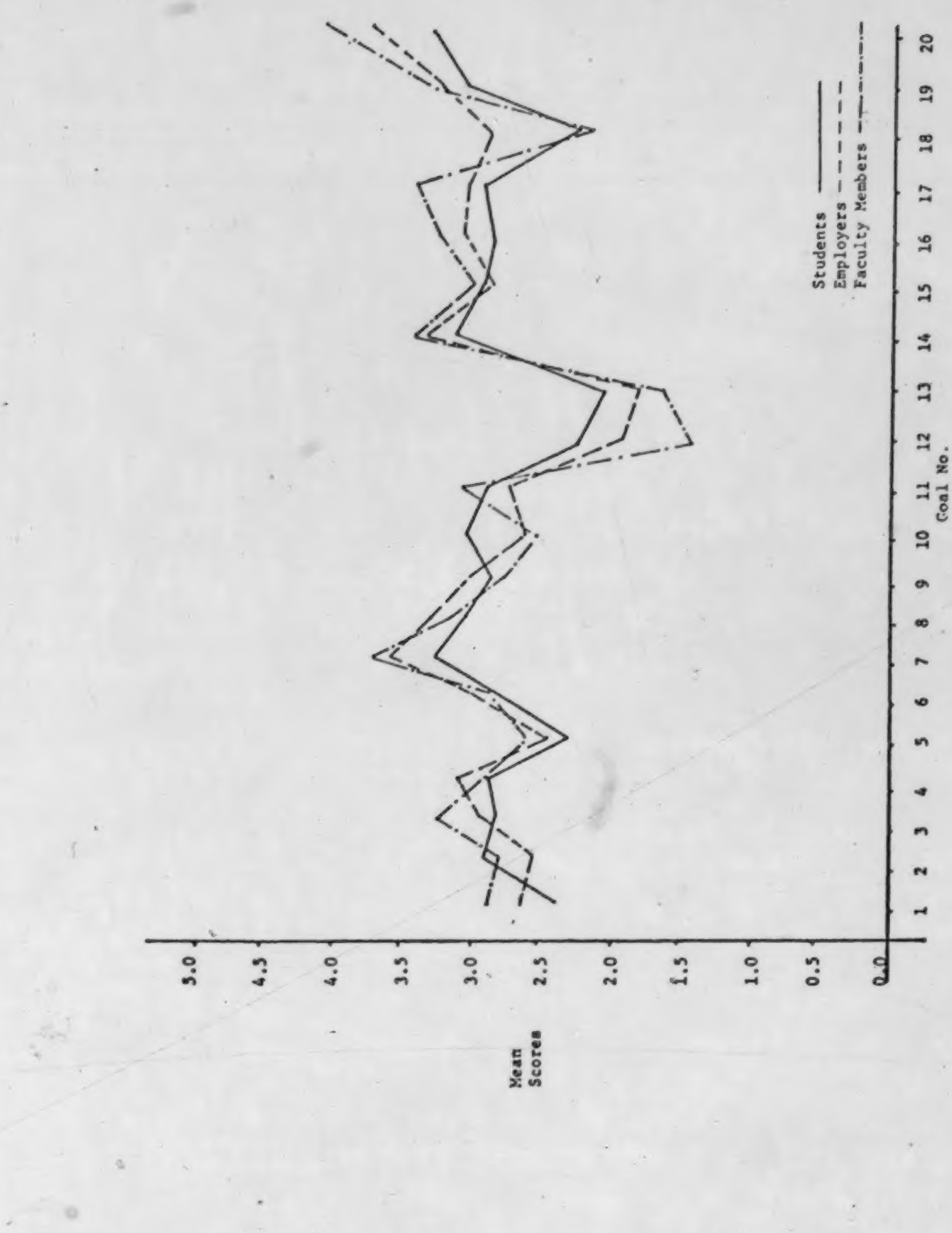

Figure 33

Graphical Presentation of Mean Scores of Present Importance of Programme Goals as Perceived by Students, Employers and Faculty Members

Table 16

Mean Scores of Main Effects: Programme Goals - Present Importance

	Programme Goals																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Mean Scores	2.65	2.77	3.00	2.98	2.45	2.87	3.52	3.14	2.87	2.76	2.85	1.85	1.79	3.38	2.90	3.07	3.13	2.46	3.19	3.75

Table 17

Mean Scores of Main Effects: Groups - Present Importance of Programme Goals

	Groups		
	Students	Employers	Faculty Members
Mean Scores	2.89	2.79	2.92

The statistics generated by analysis, as shown in Table 18, revealed that at the 0.1 level a significant difference existed among the groups.

Scheffe's multiple comparison test disclosed that the students and faculty members were in agreement in their overall assessment of the importance that the College was presently placing on the goals. The difference in evaluation, identified by the two-way analysis of variance, was found to be between the employers and the other two groups (see Table 19). Due to the complexity of the graphs it was not possible, by observation, to determine the exact nature of the differences in perception.

The two-way analysis of variance also revealed that there was a significant difference among programme goals with respect to the importance participants perceived they were presently being assigned by the College. As an example, the mean score assigned goal #12, 'influencing basic beliefs', was found to significantly differ, except for goal #13, 'assisting in the choice of avocation', from the mean scores assigned the other goals. Both these goals were assigned mean scores (Table 16) substantially lower than the rest. Though analysis indicated that a significant interaction effect existed between the programme goals and the groups, this phenomenon was not studied.

A similar procedure was employed to study the three groups' perceptions of the preferred importance of the programme goals (see Tables 9, 10 and 11). The line graphs in Figure 34 follow nearly an identical pattern to those derived for the present importance of the programme goals. Variations in the line graphs again suggested that each programme goal had been assigned a different preference weight by the total sample. Also the three groups appeared to differ in the

Table 18

Analysis of Variance of Present Importance of Programme Goals as Perceived by Students, Employers and Faculty Members

Source of Variation	SS	df	MS	F	p
Programme Goals	587.57	19	30.92	32.88	0.000000
Groups	8.61	2	4.31	4.58	0.010328
Goals x Groups	86.88	38	2.29	2.43	0.000002
Within	3555.57	3780	0.94		
Total	4238.63	3839			

Mean Scores
  Goals (Table 16)
  Groups (Table 17)
  Goals x Groups (Tables 5, 6 and 7)
$p < 0.1$

Table 19

Scheffes Multiple Comparison of Main Effects: Difference Among Students', Employers' and Faculty Members' Perceptions of Present Importance of Programme Goals

Groups	Contrast	F	P
1 2	0.097	3.742	0.024
1 3	-0.027	0.158	0.854
2 3	-0.124	0.283	0.059

Group 1	Students	N=111
Group 2	Employers	N= 56
Group 3	Faculty Members	N= 25

$p < 0.1$

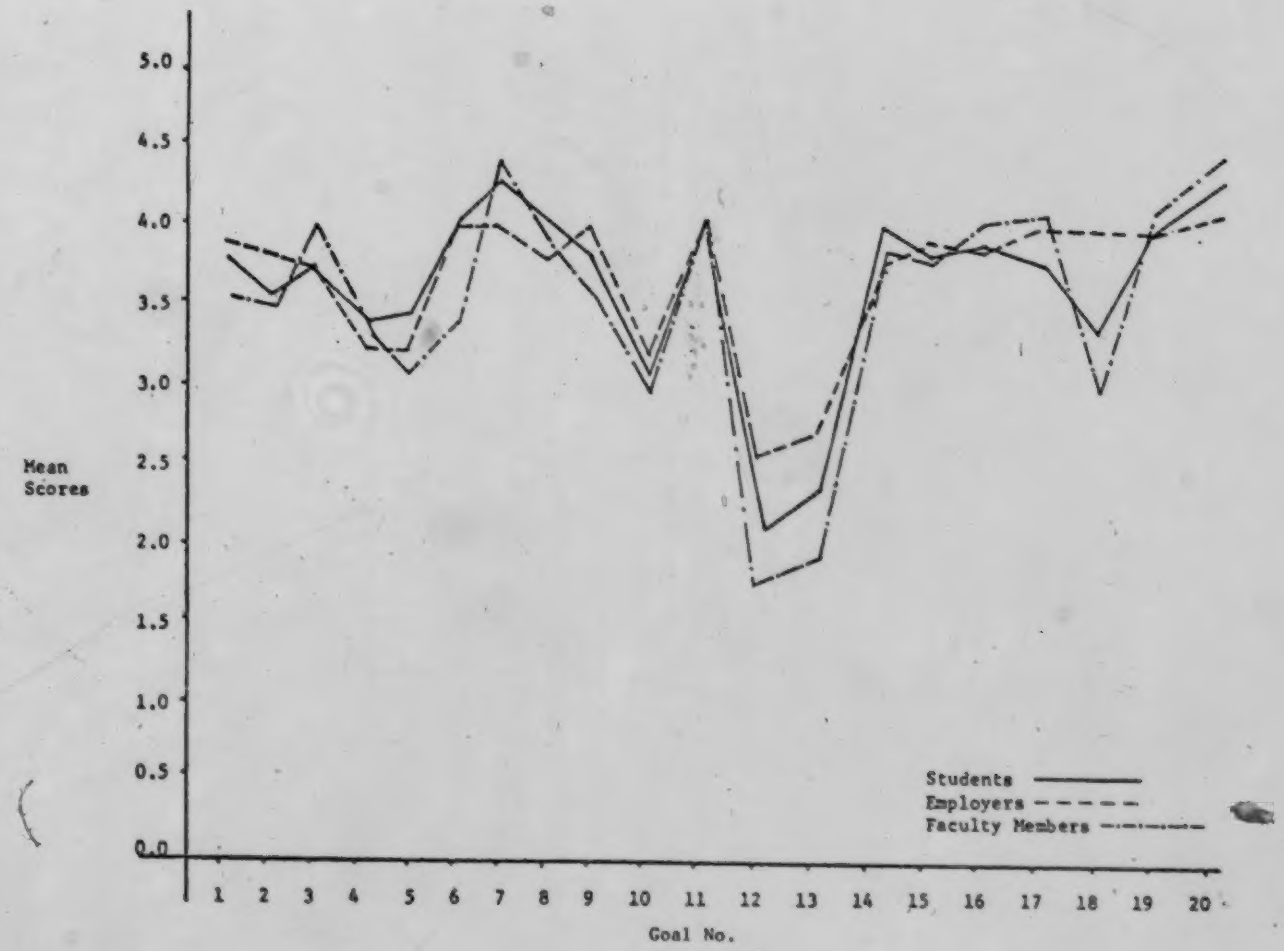

Figure 34

Graphical Presentation of Mean Scores of Preferred Importance of Programme Goals as Perceived by Students, Employers and Faculty Members mean preference score they gave the set of goals. These observations, as shown in Table 20 and Table 21, were confirmed by the appropriate computations.

A two-way analysis of variance test statistically substantiated a significant difference existed (Table 22) among the groups with respect their members' preferences. A significant interaction effect was also exposed, but as in previous discussion, this relationship was not examined. The Scheffe test of difference between means disclosed (Table 23) that a significant difference existed between the perceptions of the faculty members and those of the other groups. These findings differed from the previous analysis of the present importance of programme goals, when the assessments of the employers differed from those of the students and faculty members.

A significant difference was also shown to exist among the programme goals with respect to the preference weight they were assigned by participants. Since the nature of the relationships was difficult to identify from the graphs (Figure 34), a Scheffe test of difference was undertaken. The statistics presented in Table 24 show that the mean preference score assigned goal #20, 'raising the level of vocational achievement', differed significantly from the mean preference scores given all but five of the other goals.

Discussion. The graphs drawn from the data suggested that the students, employers, and faculty differed in their assessments of the emphasis presently being assigned the twenty programme goals by the College. These observations were statistically tested by a two-way analysis of variance procedure, which disclosed that the overall evaluation of the

Table 20

Mean Scores of Main Effects: Programme Goals - Preferred Importance

	Programme Goals																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Mean Scores	3.78	3.68	3.83	3.27	3.30	3.84	4.24	3.91	3.80	3.19	4.09	2.17	2.36	3.93	3.87	4.00	4.06	3.35	4.10	4.40

Table 21

Mean Scores of Main Effects: Groups - Preferred Importance of Programme Goals

	Groups		
	Students	Employers	Faculty Members
Mean Scores	3.69	3.70	3.58

Table 22

Analysis of Variance of Preferred Importance of Programme Goals as Perceived by Students, Employers and Faculty Members

Source of Variation	SS	df	MS	F	p
Programme Goals	852.03	19	44.84	58.67	0.000000
Groups	5.31	2	2.65	3.47	0.031136
Goals x Groups	66.91	38	1.76	2.30	0.000010
Within	2889.31	3780	0.76		
Total	3813.56	3839			

Mean Scores
  Goals (Table 20)
  Groups (Table 21)
  Goals x Groups (Table 9, 10 and 11)
$p < 0.1$

Table 23

Scheffes Multiple Comparison of Main Effects: Difference Among Students', Employers' and Faculty Members' Perceptions of Preferred Importance of Programme Goals

Groups	Contrast	F	p
1 2	-0.012	0.067	0.935
1 3	0.105	2.954	0.052
2 3	0.117	3.089	0.046

Group 1	Students	N=111
Group 2	Employers	N= 56
Group 3	Faculty Members	N=25

$p < 0.1$

Table 24

Scheffes Multiple Comparison of Main Effects: Difference Between Mean Score of Preferred Importance of Programme Goal No. 2 and the Mean Scores of Five Other Goals

					Rank		
Goal No.	Description	Contrast	F	p	Student	Employer	Faculty
7	Raising the Level of Education Achievement	-0.226	0.192	0.999	2.0	6.0	2.0
8	Improving Self Concept	-0.603	1.367	0.131	5.5	14.0	8.5
14	Raising Level of Income	-3.689	0.513	0.959	4.0	17.0	15.0
17	Increasing Problem-Solving Ability	-0.613	1.413	0.109	9.0	2.0	3.5
19	Improving Critical Thinking	-0.557	1.167	0.276	7.0	3.0	3.5

$p < 0.1$

employers was significantly different from that of the students and faculty. Though the complexity of the graphs prevented an accurate interpretation of these findings, there was evidence that the assessments of the employers fluctuated less than those of the other two groups. A similar analysis revealed that the faculty's assessment of the preferred importance of the specified goals differed significantly from those of the students and employers. After re-examining the graphs it was concluded that the assessments of the faculty were lower than those of the other participants for fifty-five percent of the programme goals.

Divisional Level Enquiry

To illustrate the potential value of studying programme goals at a divisional level, the analysis conducted in this section was repeated employing the students' perceptions of the degree of importance that 'should be' and 'is' being placed on the prescribed goals. The findings of this analysis have been presented in Appendix H.

Learning Environment

> Objective 6.2: To secure graduates' evaluations of the learning environment in which they received their training.

Introduction

A student's satisfaction with college was assumed to be partially determined by the learning environment in which he received his training. Graduates were therefore asked to evaluate six dimensions of the setting in which they were educated (Table 25) on a five-point scale extending from one (poor) to five (excellent). The responses of graduates were

Table 25

Learning Environment Dimensions

Dimension No.	Description
1	Quality of Instruction
2	Instructors Interest in Students
3	Preparation for Job Interview
4	Assisting in Overcoming Learning Difficulties
5	Assistance to Resolve Personal Problems
6	Assistance in Finding a Job
7	Achieving Educational and Vocational Goals

classified according to the division that offered the programme in which they had been enrolled, while those of dropouts were summarized without any consideration to the division from which they had withdrawn.

Learning Environment Dimensions

Findings. The data presented in Table 26 reveal that the graduates from the Business Division were most satisfied with the following two dimensions of the learning environment:

#6 Assistance in finding a job

#2 Instructors' interest in students.

Though graduates from the Service Division ranked high dimension #2, similar to their peers from the Business Division, these students ranked dimension #6 last. Graduates from the Technical Division and the dropouts ranked highest the same dimensions as participants from the Service Division programmes.

At the other end of the continuum, a study of Table 26 reveals, graduates from the Business Division ranked lowest the following two dimensions:

#4 Assisting in Overcoming Learning Difficulties

#3 Preparation for a Job Interview.

Students from the other three groups similarly ranked low dimension #3, though the actual order differed, to some extent, from one group to another. Furthermore, except for graduates from the Service Division, dimension #4 was also ranked low by other participants. Most graduates, irrespective of the division they attended, appeared to be in agreement as to which dimensions of the learning environment they were most and least satisfied. Also there was a similar consensus

Table 26

Graduates' and Dropouts' Evaluations of the Learning Environment in Which They Received Their Training
N=131

Evaluations				
Status/ Division	Dimension No.	Mean Score	Standard Deviation	Rank Order
Graduates/ Business Division N=28	6	3.61	0.83	1.0
	2	3.46	1.10	2.0
	5	3.29	0.90	3.0
	1	3.11	0.97	4.0
	7	2.93	0.98	5.0
	4	2.89	0.88	6.0
	3	2.79	1.10	7.0
Graduates/ Service Division N=48	2	3.98	0.70	1.0
	1	3.83	0.78	2.0
	4	3.60	0.74	3.0
	7	3.58	0.87	4.0
	5	3.00	0.98	5.0
	3	2.92	1.15	6.0
	6	2.72	1.30	7.0
Graduates/ Technical Division N=38	1	3.74	0.86	1.0
	2	3.63	1.05	2.0
	7	3.42	0.95	3.0
	6	3.39	1.22	4.0
	3	3.21	1.09	5.0
	4	3.18	0.93	6.0
	5	2.71	0.90	7.0
Dropouts/ All Divisions N=17	1	3.50	1.32	1.0
	2	3.06	1.09	2.5
	7	3.06	1.09	2.5
	5	2.82	1.13	4.0
	4	2.76	1.30	5.0
	3	2.67	1.29	6.0
	6	2.50	1.26	7.0

between the students who completed their studies and those who discontinued.

The correlation coefficients computed from the ranked data (Table 27) indicated there were relatively high, though not significant, relationships among the satisfaction ranks assigned the learning environment dimensions by graduates from the Service Division, graduates from the Technical Division,and dropouts. The only significant relationship, which was found to exist, was between the ranked dimensions of graduates from the Service Division and those of the dropouts. A futher examination of the correlation coefficients, presented in Table 27, revealed that the graduates from the Business Division ranked the learning environment dimensions in a different order than the members of the other three groups.

The mean scores assigned the learning environment dimensions by the graduates and dropouts (Table 26) were graphed, as shown in Figure 35, to elucidate on the variations in their responses. These line graphs show that the mean scores assigned the dimensions by the dropouts, in all but one instance, were lower than those of the graduates. Furthermore,the fluctuations in the graphs suggests that different mean scores were assigned to the seven learning environment dimensions by the combined groups. Similarly,the variations observed also imply that the mean satisfaction score for the total learning environment differed among the four groups. Additional computations confirmed these predictions (see Table 28 and Table 29).

Since the precise nature of the relationships represented by the graphs was difficult to determine by observation, a two-way analysis of variance was conducted which revealed there was a

Table 27

Spearman Correlation Coefficients for Graduates' and Dropouts' Rank Ordering of the Learning Environment Dimensions Forming the Setting in Which They Received Their Training

Status/ Division	Graduates/ Business	Graduates/ Service	Graduates/ Technical	Dropouts/ All Divisions
Graduates/ Business	1.000			
Graduates/ Service	0.018	1.000		
Graduates/ Technical	0.250	0.536	1.000	
Dropouts/ All Divisions	0.036	0.804	0.625	1.000

$\rho > 0.714$ (0.05 level of significance)

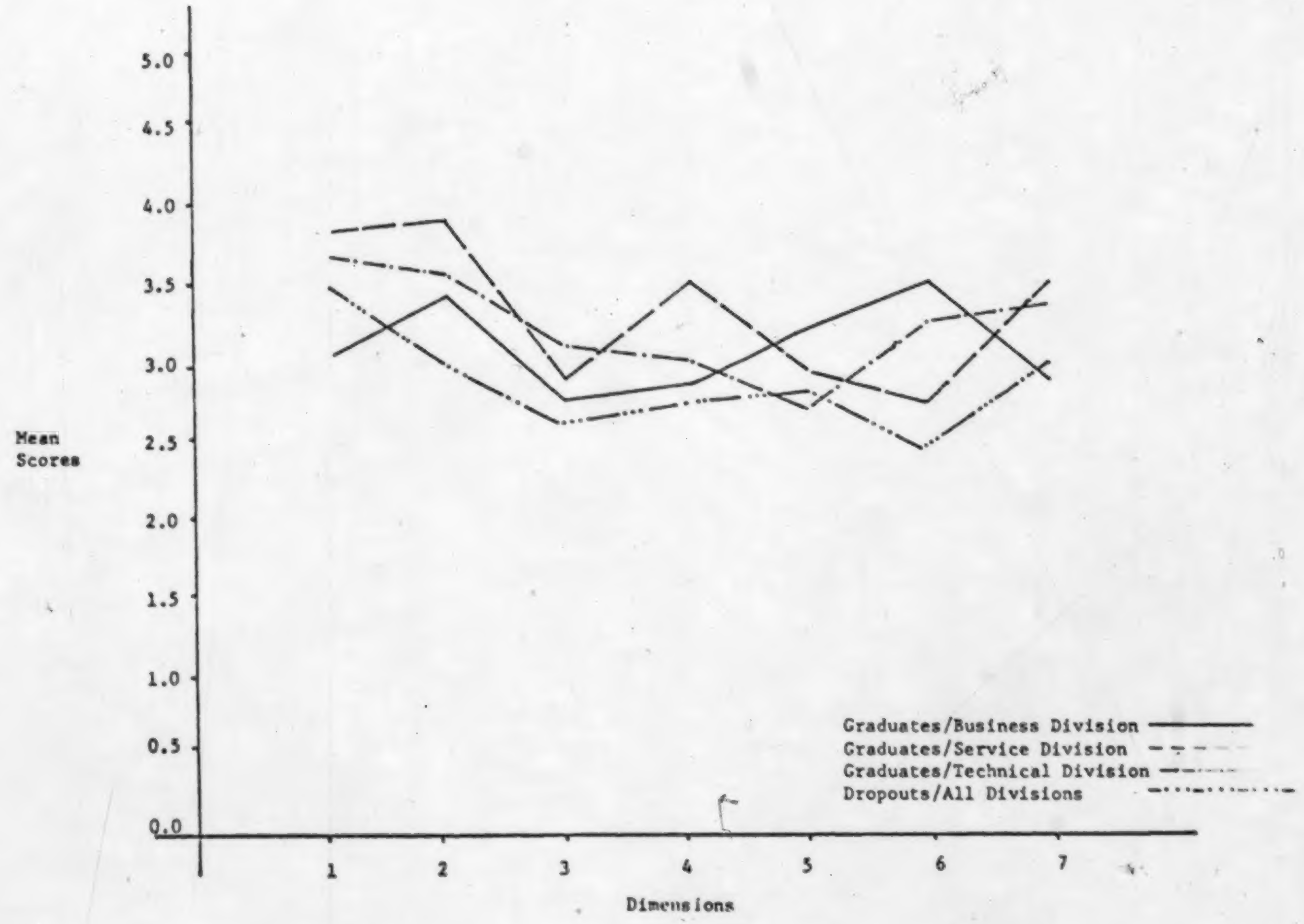

Figure 35

Graphical Presentation of Graduates' and Dropouts' Evaluations of the Learning Environment in Which They Received Their Training

Table 28

Mean Scores of Main Effects: Learning Environment Dimensions

	Learning Environment Dimensions						
	1	2	3	4	5	6	7
Mean Scores	3.48	3.53	2.82	3.11	2.94	3.02	3.25

Table 29

Mean Scores of Main Effects: Graduate and Dropout Groups

	Group			
	Graduates/ Business Division	Graduates/ Service Division	Graduates/ Technical Division	Dropouts/ All Divisions
Mean Scores	3.14	3.37	3.33	2.82

significant difference among the four groups overall evaluations of the learning environment. The statistics in Table 30 also indicate there was a significant difference among the mean scores assigned dimensions by participants. Though an interaction effect was present, no consideration was given this phenomenon. Scheffe's test of difference disclosed (Table 31) that there was a significant difference between the overall assessments of the graduates and dropouts which supported the findings inferred earlier from the graphs. The overall evaluation of the graduates from the Business Division differed significantly from that of Service Division graduates. A study of the graphs in Figure 35 suggests that this situation was due to fairly large discrepancies in the magnitude of both groups' evaluations of the learning environment.

Discussion. Both graduates and dropouts, according to the findings, perceived that the instructors, by whom they were taught, were very interested in their general welfare. Furthermore the dropouts, as well as the graduates from the Business Division and Service Division, considered the quality of instruction provided in the programmes they attended was very good. The graduates from the Business Division, however, ranked much lower than the other participants both the quality of instruction and assistance provided students to resolve learning difficulties. Based on these findings, it was concluded that Business Division graduates were less satisfied than their peers with the instructional dimensions of the learning environment in which they received their training.

All respondents considered that insufficient attention was being devoted to preparing students for job interviews, which they

Table 30

Analysis of Variance of Graduates' and Dropouts' Evaluations of the Learning Environment in Which They Received Their Training

Source of Variation	SS	df	MS	F	P
Learning Environment Dimensions	49.492	6	8.249	7.81	0.000000
Groups	30.281	3	10.093	9.56	0.000007
Dimensions x Groups	59.992	18	3.332	3.16	0.000010
Within	938.836	889	1.056		
Total	1078.601	916			

Mean Scores
  Dimensions (Table 28)
  Groups (Table 29)
  Dimensions x Groups (Table 26)
$p < 0.1$

Table 31

Scheffes Multiple Comparison of Main Effects: Difference Among Graduates' and Dropouts' Evaluations of the Learning Environment in Which They Received Their Training

Groups	Contrast	F	P
1 2	-0.231	2.090	0.098345
1 3	-0.189	1.277	0.280428
1 4	0.314	2.308	0.073832
2 3	0.042	0.083	0.964215
2 4	0.546	8.254	0.000033
3 4	0.504	6.579	0.000269

Group 1	Graduates - Business Division	N=28
Group 2	Graduates - Service Division	N=48
Group 3	Graduates - Technical Division	N=38
Group 4	Dropouts - All Divisions	N=17

$p < 0.1$

considered was an integral part of their training. Similarly participants, except those from the Service Division, perceived that students were not being provided with adequate individualized instruction. There was a general consensus that more attention should be directed to assisting individuals overcome learning difficulties.

Graphs of the mean scores assigned the learning environment dimensions by the different groups revealed, as was expected, that the dropouts were less satisfied with the learning environment, in which they were taught, than their peers who graduated. Statistical analysis also revealed that the evaluations of Business Division graduates were significantly different from those of the graduates from the Service Division. A study of the graphs indicated that, in four instances, the assessments of the former were considerably higher than those of the latter. Based on these findings it was concluded that the graduates from the Service Division were more satisfied than those from the Business Division with the learning environment.

Divisional Level Enquiry

Sufficient data on the learning environment were generated by the programme information system. Therefore, the analysis conducted in this section was repeated at a divisional level. The statistics derived from this analysis on the four Business Division programmes can be found in Appendix I. These findings illustrate how the learning environment of programmes can differ.

Vocational Training

Objective 6.3: To acquire graduates' evaluations of the vocational skills taught in the programmes they attended.

Introduction

Though the three occupational divisions studied in this investigation offered a wide variety of programmes, certain basic skills were common to all. Alternatively the development of certain specialized skills was solely the responsibility of a specific division. Graduates and dropouts who continued to participate in the study after leaving college were asked to evaluate the training they were provided in terms of nine vocational skills, noted in Table 32, which had been identified in the literature reviewed as being of major importance in many occupations. All respondents were requested to use a five-point scale, ranging from one (poor) to five (superior), to complete this assessment.

Vocational Skills

Findings. Both the graduates and dropouts, as shown in Table 33, ranked high in value the following two vocational skills:

#6 Ability to accept and follow instructions

#9 Being in regular attendance.

Though the order in which these skills were ranked differed, to some extent, from one group to another, the participants appeared to be in agreement as to which vocational skills were being given the greatest emphasis in their programmes. Similarly most students, irrespective of their status and division with which they were associated, ranked low in value two of the following skills:

#2 Developing relationships with colleagues and the public

#7 Expressing creativeness

#8 Exhibiting initiative.

Table 32

Vocational Skills

Skill No.	Description
1	Mastery of Technical Skills
2	Developing Relationships with Colleagues and Public
3	Personal Appearance
4	Readiness to Accept Responsibility
5	High Level of Dependability
6	Ability to Accept and Follow Instructions
7	Express Creativeness
8	Exhibit Initiative
9	Being in Regular Attendance

Table 33

Graduates' and Dropouts' Evaluations of the Vocational Skills Taught in the Occupational Divisions N=131

	Evaluations			
Status/ Division	Skill No.	Mean Score	Standard Deviation	Rank Order
Graduates/ Business Division N=28	6	3.54	0.84	1.5
	9	3.54	1.06	1.5
	1	3.39	1.03	4.0
	2	3.39	0.74	4.0
	3	3.39	0.74	4.0
	5	3.32	0.86	6.0
	4	3.25	0.93	7.0
	8	3.14	1.08	8.0
	7	2.89	1.10	9.0
Graduates/ Service Division N=48	9	3.81	0.79	1.0
	6	3.79	0.74	2.0
	4	3.58	0.82	3.0
	3	3.53	0.86	4.0
	5	3.52	0.92	5.0
	2	3.50	0.95	6.0
	8	3.32	0.84	7.0
	1	3.31	0.72	8.5
	7	3.31	0.97	8.5
Graduates/ Technical Division N=38	6	3.68	0.74	1.0
	1	3.58	0.83	2.0
	9	3.50	0.95	3.0
	4	3.45	0.69	4.0
	7	3.39	0.89	5.0
	5	3.32	0.81	6.5
	8	3.32	0.87	6.5
	2	3.26	0.69	8.0
	3	3.00	0.74	9.0
Dropouts/ All Divisions N=17	6	3.41	0.71	1.5
	4	3.41	0.71	1.5
	1	3.31	0.95	3.0
	9	3.19	1.05	4.0
	3	3.18	0.73	5.5
	5	3.18	0.81	5.5
	2	3.12	0.86	7.0
	8	2.88	0.99	8.0
	7	2.76	1.25	9.0

There was less agreement among participants as to the rank order of these skills than those perceived were being given the greatest emphasis. These variations appeared to reflect the different orientation of programmes.

Graduates in the Business Division rated much higher than other students skill #2,'developing relationships with colleagues and the public', which was expected since human relations is an important aspect of secretarial occupations. In contrast to the other students, these graduates ranked low skill #4,'readiness to accept responsibility', which appeared to imply that they were being assigned routine secretarial tasks in their programmes. In the Technical Division,graduates ranked skill #7,'express creativeness',much higher than their peers. This assessment was probably partly due to students in the drafting programmes being regularly provided with opportunities to develop their creative talents.

The Spearman Correlation Coefficients, computed from the participants rank ordering of the vocational skills (Table 34), revealed that a significant correlation existed between the assessments of the graduates from the Business Division, graduates from the Service Division and dropouts. These findings suggest that there was some degree of consensus among three of the four groups regarding the relative emphasis that was being placed by the College on the nine vocational skills. The correlation coefficients, presented in Table 34, also indicate that there was minimal agreement between graduates from the Technical Division and those from the Business and Service Divisions with respect to the rank the specified skills should be assigned. A

Table 34

Spearman Correlation Coefficients for Graduates' and Dropouts' Rank Ordering of the Vocational Skills Taught in the Occupational Divisions

Status/ Division	Graduates/ Business	Graduates/ Service	Graduates/ Technical	Dropouts/ All Divisions
Graduates/ Business Division	1.000			
Graduates/ Service Division	0.642	1.000		
Graduates/ Technical Divisions	0.375	0.317	1.000	
Dropouts/ All Divisions	0.625	0.613	0.675	1.000

$\rho >$ 0.600 (0.05 level of significance) re-examination of the data in Table 33 suggested no explanation for this outcome.

The graphs of the mean scores (Figure 36) assigned the vocational skills, by the members of the four groups, disclosed that in many instances their evaluations were similar. Only in skill areas #1, #2 and #3 was there a noticeable divergence from a common trend. Variations in the line graphs suggest that the nine skill areas were assigned different mean scores by the respondents. This observation was confirmed when mean scores were computed for each vocational skill from the responses of all participants (see Table 35). A similar computation, as shown in Table 36, revealed that the mean score for the combined vocational skills differed among the groups.

The graduates' and dropouts' perceptions of the emphasis that the nine vocational skills were given by the occupational divisions were analyzed statistically by two-way analysis of variance. Presented in Table 37 are the findings of this analysis, which reveal there was a significant difference among the four groups' overall evaluations of the vocational training provided by Vancouver Vocational Institute. Also it is shown that evaluations of significantly different magnitude were assigned the nine vocational skills by respondents. No interaction effect was found to exist.

Further analysis involving the Scheffe test (Table 38) disclosed that the overall assessment of the dropouts differed significantly from that of the graduates. A study of the graphs, in Figure 36, reveals that the assessments of the dropouts, in most instances, were lower than that of the graduates. However the investigator feels it is important to point out that the dropouts'

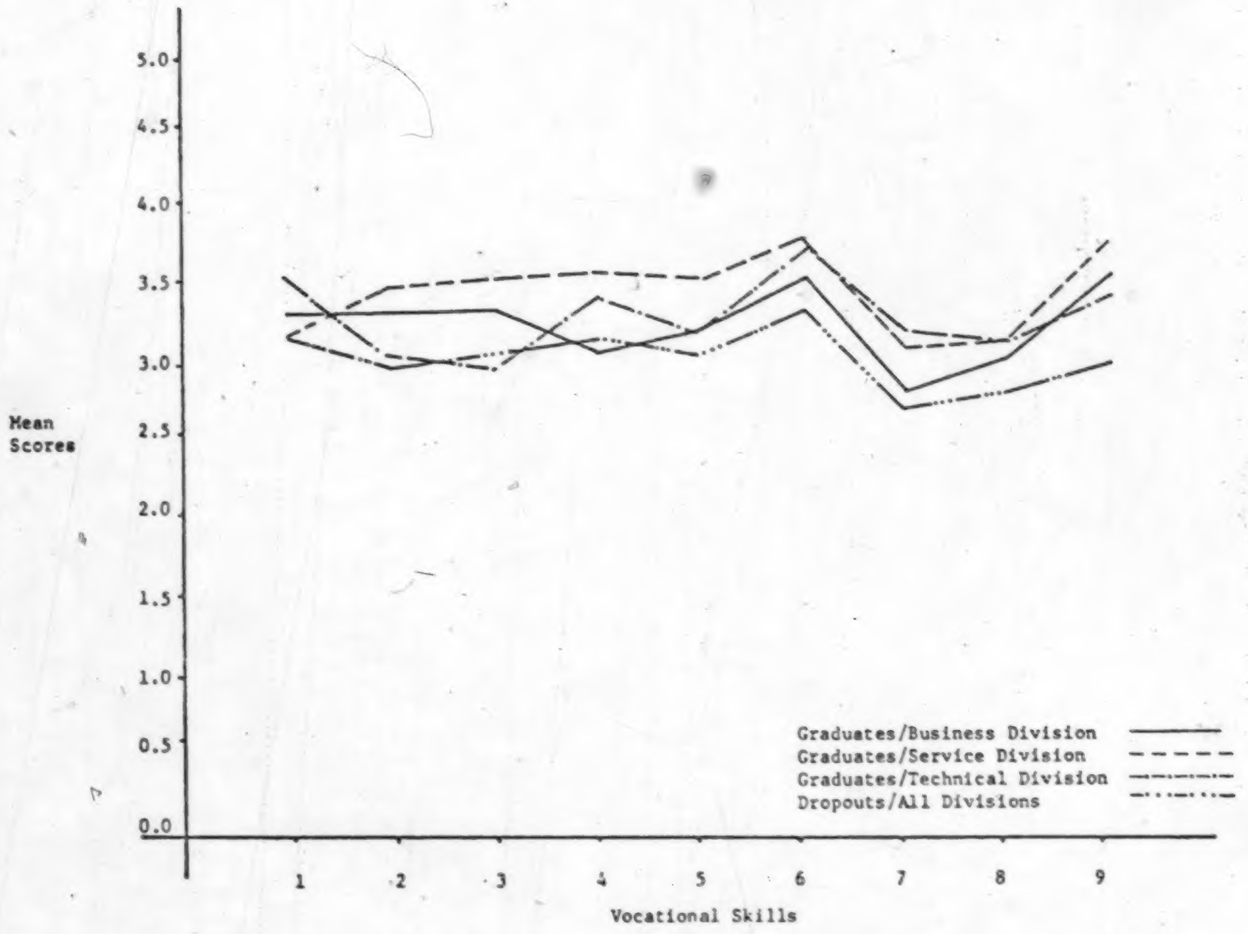

Figure 36

Graphical Presentation of Graduates' and Dropouts' Evaluations of the Vocational Skills Taught in the Occupational Divisions

Table 35

Mean Scores of Main Effects: Vocational Skills

	Vocational Skill								
	1	2	3	4	5	6	7	8	9
Mean Scores	3.35	3.32	3.26	3.42	3.33	3.61	3.09	3.15	3.46

Table 36

Mean Scores of Main Effects: Graduate and Dropout Groups

	Group			
	Graduates/ Business Division	Graduates/ Service Division	Graduates/ Technical Division	Dropouts/ All Divisions
Mean Scores	3.32	3.51	3.39	3.12

Table 37

Analysis of Variance of Graduates' and Dropouts' Evaluations of the Vocational Skills Taught in the Occupational Divisions

Source of Variation	SS	df	MS	F	p
Vocational Skills	22.371	8	2.796	3.57	0.000420
Groups	18.246	3	6.082	7.77	0.000058
Skills x Groups	17.027	24	0.709	0.91	0.593813
Within	894.648	1143	0.783		
Total	952.292	1178			

Mean Scores
  Skills (Table 35)
  Groups (Table 36)
  Skills x Groups (Table 33)
$p<0.1$

Table 38

Scheffes Multiple Comparison of Main Effects: Difference Among Graduates' and Dropouts' Evaluations of the Vocational Skills Taught in the Occupational Divisions

Groups	Contrast	F	p
1 2	-0.187	2.374	0.067416
1 3	-0.071	0.315	0.816297
1 4	0.199	1.619	0.181542
2 3	0.116	1.089	0.353166
2 4	0.387	7.206	0.000119
3 4	0.271	3.312	0.019333

Group 1	Graduates - Business Division	N=28
Group 2	Graduates - Service Division	N=48
Group 3	Graduates - Technical Division	N=38
Group 4	Dropouts - All Divisions	N=17

$p< 0.1$

Table 39

Employers' and Graduates' Evaluations of the Vocational Skills Taught at the College
N=168

	Evaluations			
Groups	Skill No.	Mean Score	Standard Deviation	Rank Order
Employers	9	3.96	0.73	1.0
N=54	5	3.78	0.74	2.0
	6	3.63	0.81	3.0
	3	3.60	0.60	4.0
	2	3.48	0.69	5.0
	1	3.46	0.86	6.0
	8	3.43	0.81	7.0
	4	3.39	0.86	8.0
	7	3.13	0.78	9.0
Graduates	6	3.69	0.77	1.0
N=114	9	3.64	0.92	2.0
	4	3.46	0.81	3.0
	1	3.42	0.84	4.0
	5	3.40	0.87	5.0
	2	3.39	0.82	6.0
	3	3.32	0.82	7.0
	8	3.27	0.82	8.0
	7	3.24	0.99	9.0

evaluations except for two skill areas was greater than three. The statistics generated by the Scheffe test, revealed the overall assessment of the graduates from the Business Division was significantly different from those of students who graduated from the Service and Technical Divisions.

In Figure 36 it can be clearly seen that graduates from the Service Division were more satisfied than any other group of students with the training they were provided in the nine skill areas. Also the graphs show that, though the evaluations of the graduates from the Business and Technical Divisions fluctuated widely, the latter assigned a higher satisfaction weight to more skills than the former.

Discussion. The vocational skills ranked highest in value by the graduates and dropouts, in the investigator's opinion, reflected on effort by the College to assist students acquire sound work habits. At the other end of the continuum, respondents perceived that insufficient attention was being given to providing students with opportunities to express their creativeness and exhibit initiative. However, as indicated in the findings, the order of the low ranked skills differed among the groups. Based on observations and the data gathered, the investigator concluded that these variations reflected the different orientation of programmes.

Statistical analysis, of the participants responses, revealed that the assessments of the groups were significantly different. The graphs, in Figure 36, indicated that the dropouts' assessements were generally lower than those of the graduates. However, as previously noted, the dropouts evaluated high most of the vocational skills,which suggested they were satisfied with the training they received. Similarly,it was inferred from the line graphs that the graduates from the Business Division were less satisfied with the training they received than the other graduates. These observations were confirmed by the Scheffe test of difference.

Employers' Evaluations

Findings. The data, presented in Table 39, indicate that both the employers and students ranked high in satisfaction the following two skill areas: (1) being in regular attendance; and (2) ability to accept and follow instructions. During telephone conversations, several supervisors reported that if a graduate was dismissed soon after being hired, frequently it was because they either argued with their supervisor or failed to attend work regularly. These comments explained, to some extent, why considerable emphasis was placed on the two skill areas. At the other end of the continuum both the employers and the graduates ranked low the following vocational skills: (1) 'express creativeness'; (2) ' exhibit initiative'. A deficiency in training, in these specific vocational skills, was also identified in previous analysis on programme goals.

The graphs of the employers' and graduates' evaluations, presented in Figure 37, reveal that the employers' level of satisfaction was generally higher than that of the graduates. Statistical analysis, however, disclosed (Table 40) that a significant difference existed between the evaluations of the employers and graduates in the following skill areas:

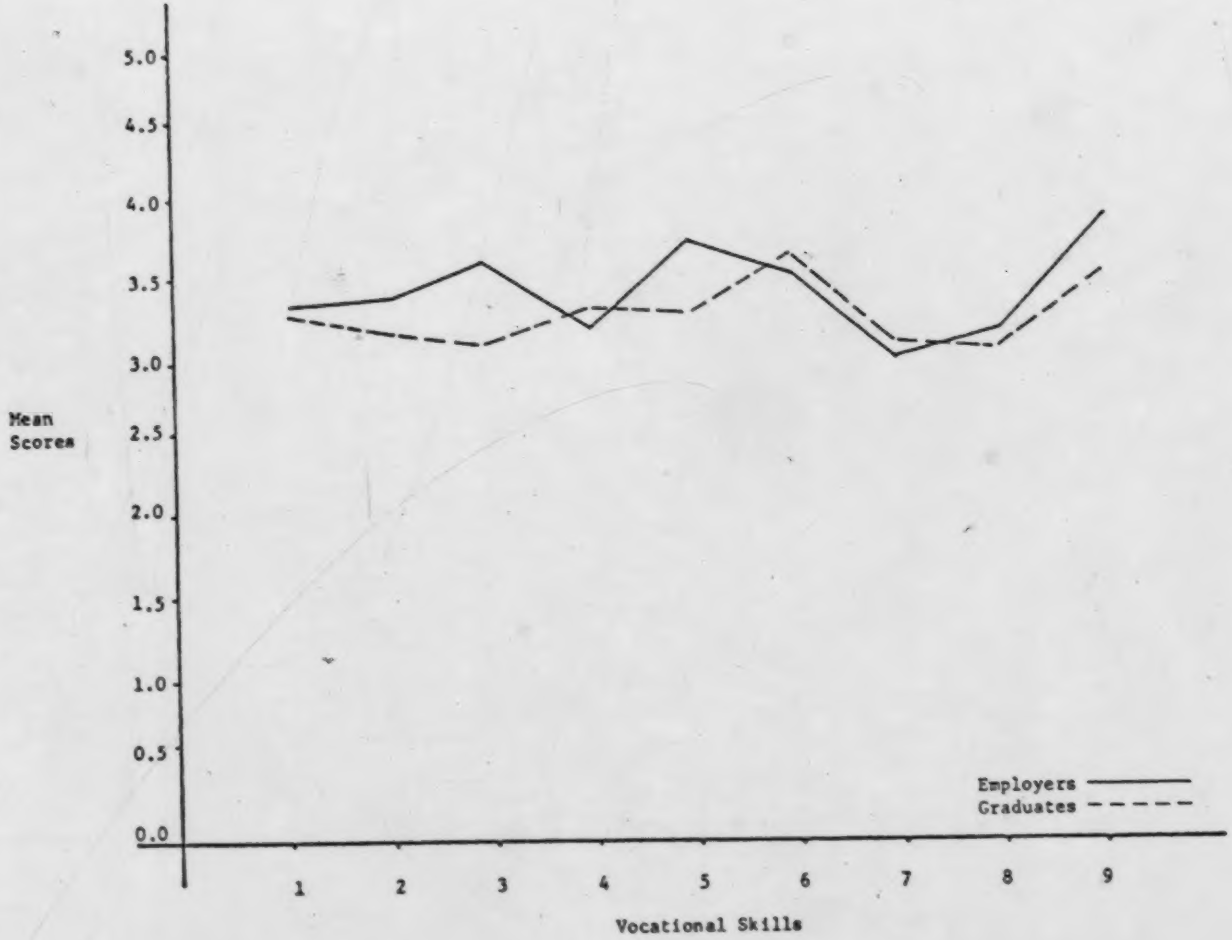

Figure 37

Graphical Presentation of Employers' and Graduates' Evaluations of the Vocational Skills Taught at the College

Table 40

Summary of the Tests of Difference Between Employers' and Graduates' Evaluations of the Vocational Skills Taught in the Occupational Divisions

Skill No.	1	2	3	4	5	6	7	8	9
Mean Scores									
employers	3.460	3.480	3.600	3.390	3.780	3.630	3.130	3.430	3.960
graduates	3.420	3.390	3.320	3.460	3.400	3.690	3.240	3.270	3.640
t value	0.299	0.674	1.676	0.493	2.725	0.492	0.700	1.063	2.258
p level	0.383	0.251	0.048	0.312	0.035	0.312	0.243	0.145	0.013

$p < 0.05$

Table 41

Mean Scores of Main Effects: Vocational Skills

	Vocational Skill								
	1	2	3	4	5	6	7	8	9
Mean Scores	3.44	3.43	3.46	3.42	3.59	3.66	3.19	3.35	3.80

#3 Personal appearance

#5 High level of dependability

#9 Being in regular attendance.

In each of these cases, the employers indicated that they were more satisfied than the graduates with the training provided in the specified skill areas.

Though the employers and graduates were satisfied with the training provided , learning experiences in certain skill areas (Table 41) were considered to be better than others. Also the employers' overall evaluation of the training, according to the data in Table 42, was higher than that of the graduates. These general observations were confirmed by statistical analysis (see Table 43).

Discussion. The employers and graduates, according to the findings, were very satisfied with the vocational training offered at Vancouver Vocational Institute. Though some variations existed in their responses, both groups perceived that the College was placing considerable emphasis on training students to be accountable for their actions and willing to accept orders from supervisors. According to a number of supervisors and managers, interviewed by telephone, deficiencies in these areas often resulted in new employees being dismissed. Both groups were in agreement that existing programme curricula were deficient in assisting students become creative and more responsible.

Divisional Level Enquiry

At a divisional level students' satisfaction with the training provided in specific skill areas can vary considerably from one programme to another. The strengths and weaknesses of individual programmes, however, are not always apparent when the training offered by a division is analyzed at a

Table 42

Mean Scores of Main Effects: Employer and Graduate Groups

	Group	
	Employers	Graduates
Mean Scores	3.54	3.42

Table 43

Analysis of Variance of Employers' and Graduates' Evaluations of the Vocational Skills Taught at the College

Source of Variation	SS	df	MS	F	p
Vocational Skills	30.301	8	3.788	5.22	0.000002
Groups	4.215	1	4.215	5.81	0.015357
Skills x Groups	9.875	8	1.234	1.70	0.093447
Within	1083.790	1494	7.254		
Total	1128.181	1511			

Mean Scores
Skills (Table 41)
Groups (Table 42)
Skills x Groups (Table 39)

$p < 0.1$

higher organizational level. Presented in Appendix J are the satisfaction weights, graphs, and statistics obtained from students' and employers' assessements of the vocational training provided by the four Service Division programmes. These data illustrate the extent to which students' satisfaction with the training they receive varies among programmes.

Instruction

Objective 6.4: To obtain graduates' evaluations of the instructional practices employed by the faculty.

Introduction

Both a student's success and satisfaction with college are partially determined by the quality of instruction to which he is exposed. If the faculty with whom he comes in contact are competent, flexible, and able to establish good rapport with individuals, a student usually progresses fairly rapidly and is reasonably satisfied with his programme.

During the follow-up phase of this investigation, students were required to evaluate the instructor(s) by whom they were taught while attending Vancouver Vocational Institute. Before presenting the findings yielded by analysis, the investigator considers it important to emphasize that these evaluations were the opinions of a specific group of students who were attending the College during the period of the study. At another point in time a different group of students might provide contrary evaluations. Under these conditions the findings presented in this section, should be viewed as an indication of a typical group of students' satisfaction with the instruction they received while attending College.

The literature reviewed inferred that teaching is a complex phenomenon, the nature of which we possess limited knowledge at present.

Though investigations have been conducted to try to isolate factors that characterize outstanding instructors, the findings have tended to be rather vague and on occasions inconsistent. In view of these conditions, the investigator limited his enquiry to studying fourteen instructional practices (Table 44) that were reported, in the literature, to be major dimensions of teaching. These practices are obviously not exhaustive of those employed by instructors, however they do provide a framework for evaluating the instructional styles of faculty members.

Instructional Practices

Findings. Graduates from the Business Division, according to the data presented in Table 45, were most satisfied with the following two practices, which characterized the majority of instructors by whom they were taught:

#6 Instructors appeared confident and poised

#7 Students were not criticized or embarrassed in class.

Though the graduates from the other two divisions and the dropouts also ranked these two dimensions high, they placed a higher priority on practice #14,'organization of material',than their peers in the Business Division. All the graduates, in contrast to the dropouts, also ranked high practice #10,'instructors were concerned that students understood the material being taught'. Since members of the former group discontinued their studies,this response was perhaps to be expected.

At the other end of the continuum, the graduates from the Business Division ranked low (Table 45) the following three practices employed by the majority of instructors:

#1 General inability to present material in an entertaining manner

#5 Lack of unusual facility for communicating their knowledge to students

Table 44

Instructional Practices

Practice No.	Description
1	Presentation of Material
2	Utilization of Personal Experiences
3	Familiarity with Student Life
4	Quality of Lectures
5	Communication of Knowledge
6	Instructors Confidence and Poise
7	Criticism of Students
8	Relating Material to Contemporary Problems
9	Distinguishing between Major and Minor Ideas
10	Ensuring Students Understand Material Taught
11	Participation of Students in Determining Class Objectives and Procedures
12	Out-of-Class Assignments
13	Opportunities for Students to Participate in Discussions
14	Organization of Material

Table 45

Graduates' and Dropouts' Evaluations of the Instructional Practices of the College Faculty
N=131

Evaluations

Status/ Division	Practice No.	Mean Score	Standard Deviation	Rank Order
Graduates/ Business Division	6	4.39	0.96	1.0
	7	4.18	1.06	2.5
	10	4.18	1.25	2.5
	3	4.04	1.14	4.0
N=28	14	3.86	1.35	5.0
	2	3.82	1.12	6.0
	12	3.68	1.56	7.0
	9	3.57	1.53	8.0
	13	3.54	1.35	9.0
	4	3.36	1.39	10.0
	8	3.14	1.58	11.0
	1	2.79	1.23	12.0
	5	2.71	1.41	13.0
	11	2.68	1.52	14.0
Graduates/ Service Division	6	4.67	0.76	1.0
	14	4.40	1.15	2.0
	10	4.38	1.15	3.0
	7	4.32	0.97	4.0
N=48	13	4.22	1.17	5.0
	2	4.10	1.26	6.5
	4	4.10	1.10	6.5
	9	3.65	1.42	8.0
	3	3.57	1.45	9.0
	12	3.56	1.60	10.0
	1	3.47	1.28	11.0
	11	3.32	1.37	12.0
	8	3.05	1.43	13.0
	5	2.84	1.44	14.0

Table 45 (Continued)

Evaluations				
Status/ Division	Practice No.	Mean Score	Standard Deviation	Rank Order
Graduates/ Technical Division	6	4.76	0.70	1.0
	10	4.50	0.86	2.0
	14	4.42	0.83	3.0
	13	4.34	0.99	4.0
N=38	2	4.16	0.97	5.0
	7	4.03	1.05	6.0
	9	3.79	1.12	7.0
	4	3.47	1.06	8.0
	3	3.42	1.20	9.0
	8	3.39	1.26	10.0
	12	3.34	1.40	11.0
	1	2.92	1.28	12.0
	5	2.84	0.97	13.0
	11	2.05	1.01	14.0
Dropouts/ All Divisions	6	4.19	1.22	1.0
	14	4.06	1.48	2.0
	8	3.94	1.34	3.0
	2	3.69	1.54	5.0
N=17	7	3.69	1.45	5.0
	10	3.69	1.58	5.0
	9	3.44	1.50	7.0
	12	3.38	1.59	8.5
	13	3.38	1.59	8.5
	4	3.13	1.59	10.0
	5	3.07	1.49	11.0
	3	2.94	1.61	12.0
	1	2.88	1.67	13.0
	11	2.31	1.49	14.0

#11 Reluctance to offer students an opportunity
to determine class objectives and procedures.

Students in the other three groups similarly ranked low in satisfaction the same three instuctional practices as the graduates from the Business Division. These findings suggest that the participants, irrespective of the division they attended, were in agreement as to which instructional practices they considered to be least satisfactory.

Statistical analysis of the order in which the participants ranked the instructional practices being studied yielded, as shown in Table 46, high correlation coefficients which were significant at the 0.05 level. The very high correlation coefficients derived for the graduates' rank ordering of the practices, suggests that there was a general consensus among graduates with respect to their relative satisfaction with the various dimensions of the instruction they received while attending College. These statistics also imply that similar instructional practices were employed throughout the College.

The graphs of the mean evaluation scores (Figure 38) assigned the fourteen instructional practices by the participants, reveal that, in most instances, the four groups were in general agreement as to whether a certain practice was employed by a majority or minority of the instructors by whom they were taught. Fluctuations in the nine graphs imply that participants were more satisfied with certain instructional practices than others. This observation was confirmed by computing the mean satisfaction score for each practice from the responses of the total sample (see Table 47). Though the four line graphs generally move in the same direction the mean scores, presented in Table 48, indicate that the groups differed in their

Table 46

Spearman Correlation Coefficients for Graduates' and Dropouts' Rank Ordering of the Instructional Practices Employed by the College Faculty

Status/ Division	Graduates/ Business	Graduates/ Service	Graduates/ Technical	Dropouts/ All Divisions
Graduates/ Business Division	1.000			
Graduates/ Service Division	0.815	1.000		
Graduates/ Technical Division	0.802	0.938	1.000	
Dropouts/ All Divisions	0.648	0.646	0.857	1.000

$\rho > 0.456$ (0.05 level of significance)

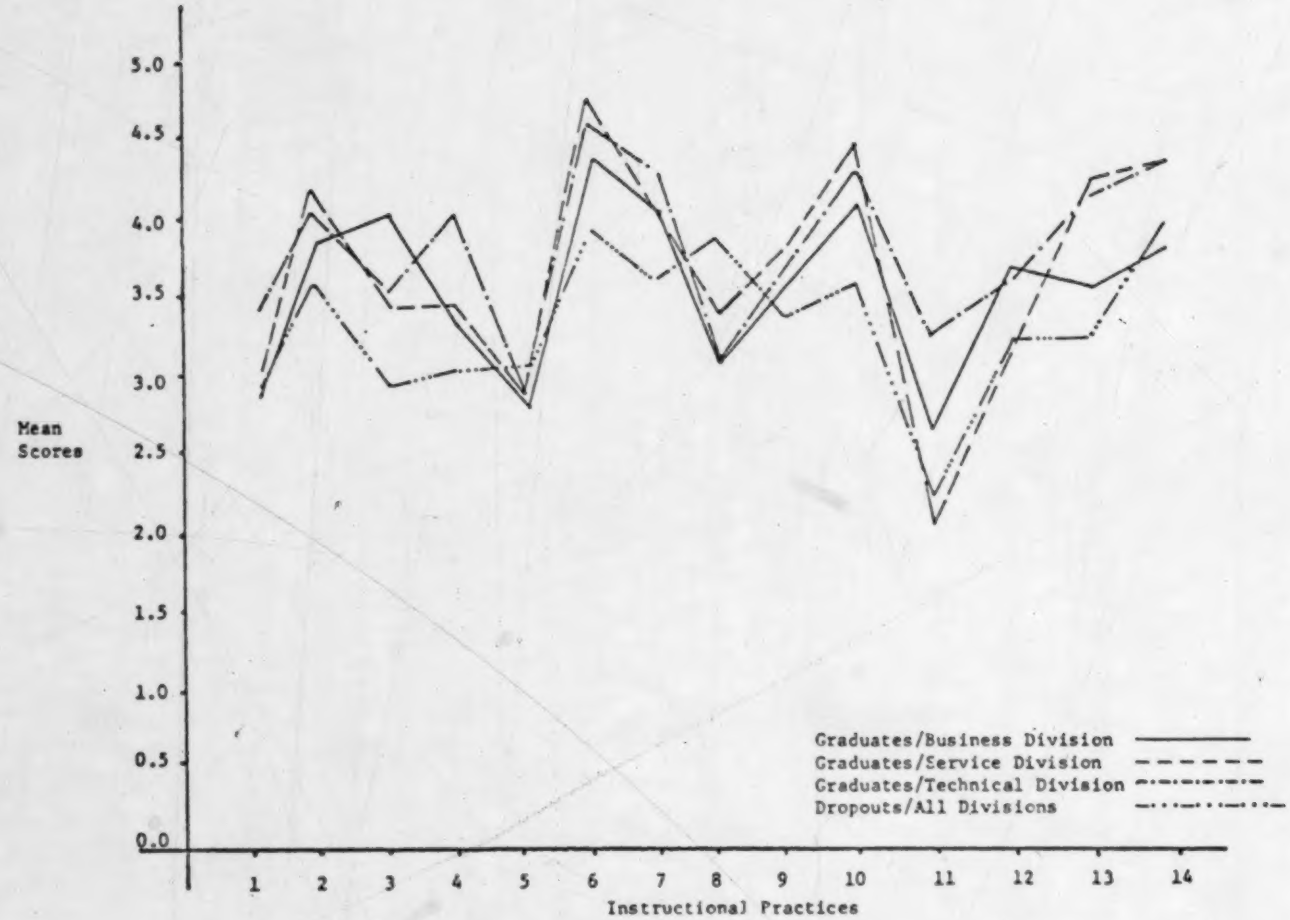

Figure 38

Graphical Presentation of Graduates' and Dropouts' Evaluations of the Instructional Practices of the College Faculty

Table 47

Mean Scores of Main Effects: Instructional Practices

	Instructional Practice													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mean Scores	2.94	3.97	3.49	3.55	2.84	4.53	4.02	3.43	3.62	4.15	2.61	3.44	3.84	4.22

Table 48

Mean Scores of Main Effects: Graduate and Dropout Groups

	Group			
	Graduates/ Business Division	Graduates/ Service Division	Graduates/ Technical Division	Dropouts/ All Divisions
Mean Scores	3.53	3.86	3.77	3.31

overall evaluation of instruction.

A two-way analysis of variance test, as shown in Table 49, statistically confirmed there was a significant difference among the four groups with respect to their overall assessment of the instructional practices to which they had been exposed. Also this analysis disclosed, as previously concluded from studying the line graphs, that significantly different satisfaction weights were assigned by participants to the instructional practices under review. Though an interaction effect was found to be present, this phenomenon, as in previous analysis, was not examined. The Scheffe test of difference (Table 50) concerned that there was a significant difference between the overall assessment of the graduates from the Business Division and those of graduates from the other two divisions. A review of the graphs suggests that the assessements of the graduates from the Business Division were, in many instances, lower than those of their peers in the other divisions.

A significant difference was also found to exist between the evaluations of the graduates and those of the dropouts (see Table 50). A study of the graphs, presented in Figure 38 reveals that the evaluations of the dropouts were lower than those of the graduates for eight practices and second lowest for all four groups in three out of the remaining seven. The only instance when dropouts indicated that they were more satisfied than graduates with instruction was in their evaluation of practice #8;instructor's ability to relate course material to contemporary problems'.

Discussion. The respondents' rankings suggest that the faculty members

Table 49

Analysis of Variance of Graduates' and Dropouts' Evaluations of the Instructional Practices of the College Faculty

Source of Variation	SS	df	MS	F	P
Instructional Practices	426.133	13	32.779	21.25	0.000000
Groups	61.820	3	20.607	13.36	0.000000
Practices x Groups	103.910	39	2.664	1.73	0.003740
Within	2548.690	1652	1.543		
Total	3140.553	1707			

Mean Scores
  Skills (Table 47)
  Groups (Table 48)
  Skills x Groups (Table 45)
$p < 0.1$

Table 50

Scheffes Multiple Comparison of Main Effects: Difference Among Graduates' and Dropouts' Evaluations of the Instructional Practices of the College Faculty

Groups	Contrast	F	P
1 2	-0.330	5.429	0.001159
1 3	-0.242	2.855	0.035461
1 4	0.218	1.465	0.020770
2 3	0.882	0.458	0.715569
2 4	0.548	10.389	0.000002
3 4	0.460	7.208	0.000116

Group 1	Graduates - Business Division	N=28
Group 2	Graduates - Service Division	N=48
Group 3	Graduates - Technical Division	N=38
Group 4	Dropouts - All Divisions	N=17

$p < 0.1$

communicated to the individuals they taught that they were interested in their general welfare and sensitive to the norms of their peer group. A similar observation was reported by participants in their assessment of the learning environment. The majority of instructors, according to all the participants, except those from the Business Division, taught in depth the theoretical aspects of their trade. Many instructors perceived their major role to be one of communicating the basic concepts and skills of their trade to young adults seeking new careers. This accounted for them providing as comprehensive and detailed exposure to an occupation as conditions permitted.

Both the graduates and dropouts indicated in their rankings of the instructional practices, that they considered students should be involved in directing,developing and planning programmes. Informal discussions with students revealed that many were dissatisfied with existing provisions for students to communicate their concerns, expectations,and opinions to the staff. Furthermore,there was common consensus among respondents that subject matter was often not presented in an interesting manner or related to contemporary problems. This issue obviously warrants further investigation.

Statistical analysis disclosed there was a significant difference among the graduates with respect to their evaluations of the instructional practices employed by the faculty. A review of the graphs, presented in Figure 38, suggests that the assessments of the graduates from the Business Division were, in many instances, lower than those of the other graduates. It was concluded that the former were less satisfied than the latter with the instructional practices employed by the faculty by whom they were taught.

Similarly, the assessments of the dropouts were observed to be lower than those of the graduates for eight practices and second lowest, for all respondents, in three out of the remaining seven. Based on these observations, the dropouts were considered to be less satisfied than the graduates with the instructional practices of the faculty. Further statistical analysis, using the Scheffe test of difference, confirmed these conclusions.

Divisional Level Enquiry

Though a comparison of instructional practices employed by the various divisions of a community college indicates areas of strength and weakness, the aggregate nature of the data analyzed often results in important differences in instructional styles used within a division being obscured. Furthermore, a specific weakness or dissatisfaction expressed by students infers, at the college level of analysis, that all the programmes within the division concerned are characterized by this deficiency. However, this criticism may only apply to one or two programmes. Presented in Appendix K are the statistics and graphs generated for the Technical Division, which illustrate how students' evaluations of instructional practices can vary within an occupational division.

Recommendations for Improvement

Objective 6.5: To acquire from the clientele served by the College suggestions for improving programmes and services.

Introduction

Due to the nature of the programmes offered by community colleges, the size of classes are usually small, which makes it difficult to draw inferences from the responses of students. In view of these circumstances, readers are reminded that the opinions and comments of graduates and employers reported in this study are not necessarily representative of the population served by Vancouver Vocational Institute. Suggestions for change, however, do identify areas that warrant further investigation. In order to avoid any misunderstanding or misinterpretation of data the following coding system has been employed to indicate how many graduates responded in the follow-up study:

N_s: - Sample size

N_r: - Number of returns used

R_d: - Response rate (used as a percentage of the number delivered by the Post Office)

More information regarding response rates can be found in Appendix A.

Programmes

Business Division

Commercial Basic

$N_s = 7$, $N_r = 7$, $R_d = 100\%$

Findings. Seventy-one percent of the graduates, who responded from this basic secretarial programme, considered insufficient attention was given to the individual needs of students. These respondents emphasized that students should be allowed to progress at their own rate and be provided with individualized instruction when needed. Over forty percent of the graduates suggested there should be provision for those who failed to attain an adequate typing speed to continue their programme of studies beyond the specified seventeen weeks. Finally, thirty percent of the respondents reported that the programme did not meet their expectations. This situation, in their opinion, was due to inadequate counselling by Canada Manpower officials.

Discussion. Based on the responses of the graduates, who returned the follow-up questionnaire, there appears need for more individualized instruction in the Commercial Basic programme, so slow students may progress at their own rate of learning. By providing individualized instruction,graduates would be better prepared to effectively cope with general office duties. Also Canada Manpower should be provided with a detailed description of the curricula to assist them in selecting potential students for programmes.

Commercial Secretarial

$N_s = 13$, $N_r = 5$, $R_d = 39\%$

Findings. Though forty percent of the respondents did not propose any recommendations for improving this secretarial programme,the remaining sixty percent expressed concern about the equipment on which they received their training. According to the latter group, the equipment was 'out of date' and unreliable. Sixty percent of the graduates recommended that the programmes should be periodically appraised to ensure the latest business practices were being taught. This group also suggested that more attention should be devoted to preparing students for job interviews and informing them of the basic procedure to follow for securing a secretarial position after graduation. There was general agreement among the respondents that the commercial secretarial programme could be considerably improved by including a practicum in the course. As one graduate noted "being a secretary is more than learning office skills, typing and shorthand".

Discussion. Since advances in technology are revolutionizing office procedures,the machinery upon which students are trained should be of a recent design. If obsolete equipment is provided for training, as graduates have reported, the manual skills students acquire will not adequately prepare them for a modern business centre. Including a short period of 'on the job' training in the curriculum would assist students acquire the human relation skills needed to function effectively in an office setting. Through an activity of this kind the Business Division could improve its public relations with the business and commercial community.

Medical Office Assistant

$N_s = 21$, $N_r = 11$, $R_d = 52\%$

Findings. Fifty-five percent of the graduates, who responded in the follow-up study,maintained that more emphasis should be placed on assisting students having difficulty with certain aspects of the course. According to this group,students were often presently expected to comprehend fairly advanced theory before fully understanding elementary concepts. Three respondents reported that the Medical Office Assistant programme had not met their expectations. This deficiency, in their opinion, was due to insufficient details of the programme being provided by Canada Manpower counsellors when they were selecting a career. Visits to doctors' offices and medical centres were viewed as highlights of the programme by the majority of respondents. There was general agreement among the graduates that more field trips should be offered in the programme.

Discussion. According to comments expressed by graduates,there is need for more individualized instruction in this programme, if students are to fully understand what is being taught. There was evidence that a number of students had difficulty comprehending the terminology employed in the course. By offering tutorials, this problem could probably be resolved. Canada Manpower must be provided with adequate information regarding the duties medical office assistants are assigned in doctors' offices and the nature of the training provided by the College. Without adequate information Canada Manpower offices cannot effectively counsel individuals seeking admission to this highly specialized secretarial programme. Finally,through more visitations to medical centres and doctors' offices,students would better appreciate the theory and manual skills they were being taught in class.

Medical Stenographer

$N_s = 9$, $N_r = 5$, $R_d = 56\%$

Findings. All the graduates, who returned the questionnaire, were very satisfied with the basic training provided in this programme. The only criticism of the programme was that students were expected to absorb a large quantity of knowledge in a very short period of time. Forty percent of the respondents reported they had often found it difficult to retain the material presented by the instructor.

Discussion. Recent advances in the medical field have generated a vast quantity of knowledge and created new terminology which medical stenographers have to understand to effectively perform their duties. Under these circumstances an extension of the present Medical Stenographer programme is probably warranted.

Service Division

Beauty Culture

$N_s = 26$, $N_r = 13$, $R_d = 50\%$

Findings. Sixty-two percent of the graduates, who participated in the follow-up study, were dissatisfied with certain aspects of the programme. The major criticism of the present curriculum was that the elementary skills and knowledge taught in the course did not adequately prepare an individual for an apprenticeship in the trade. According to these graduates, during their attendance at College, they had only been taught one basic style and practiced mainly on senior citizens. Training of this kind, they stressed, did not equip an apprentice to undertake challenging assignments in a salon. Also there was general agreement among respondents that insufficient consideration was given to the individual needs of students. The beauty salon at the College was considered, by forty-six percent of the respondents, to be more of a business than learning centre. During their training students, according to this group, were encouraged to quickly serve customers as though the purpose of the programme was to process as many people as possible in a day. Under these conditions the graduates reported that they had found it difficult to develop adequate personal relation skills or begin acquiring an individual technique of styling.

The employers,who returned the questionnaire,agreed with the graduates that the programme offered by the College was was far too basic. Insufficient attention was given in the present curriculum, according to these salon managers,to assisting students develop interpersonal skills, become creative hairstylists or acquire distinctive techniques of their own. The owners of three salons recommended that experts in the trade should frequently be invited to give demonstrations on new techniques in hairstyling. There was general concern among the managers, who responded,that a wider cross-section of salon owners were not involved in curriculum development.

Discussion. In order for the College to provide the kind of training which students appear to desire, the present programme needs to be extended two or three months. If provided more time, instructors would be able to teach both basic and intermediate styling as well as offer more individualized instruction. Since the majority of students enrolled in the Beauty Culture programme were sponsored by Canada Manpower, the concerns and issues outlined should be discussed with members of this agency before the existing programme is extended. If the Beauty Culture programme was to adequately prepare individuals for an apprenticeship, there was evidence that better lines of communication needed to be established between salon owners and the faculty.

Waiter/Waitress

$N_s = 18$, $N_r = 11$, $R_d = 65\%$

Findings. The waiter/waitress programme was considered, by seventy-two percent of the respondents, to have been a worthwhile experience, which enabled them to secure employment of their choice. Though very pleased with their experiences at College thirty-six percent of the graduates reported that the programme could have been improved by extending its duration. If the waiter/waitress programme was extended by two months, this group perceived, instructors would be able to cover in greater depth topics of major importance in the trade, offer more options and arrange more field trips to hotels. One area which the graduates considered should have been given more attention in the programme was the serving of alcoholic beverages, which waiters and waitresses were often expected to be able to serve with meals.

Discussion. The findings suggest that the waiter/waitress programme should be extended in length, so students can be provided with better training. At present, for instance, instructors are only able to arrange a few field trips to hotels, though such visitations are an important feature of the training programme. Since new Canadians are often attracted to this programme, both College and Manpower counsellors should ensure that prospective students are able to adequately communicate in English. Though the faculty members were observed to be very understanding and patient with students who had difficulty with English, employers in general appeared to be less tolerant.

Short-Order Cook

$N_s = 22$, $N_r = 18$, $R_d = 82\%$

Findings. Though seventy-eight percent of the respondents considered the quality of instruction offered in the short-order cook programme to be excellent, sixty-seven percent of this group reported that insufficient time was provided for students to fully comprehend the basic concepts of the trade and acquire proficiency in the practical aspects of cooking. A large number of students in this programme were new Canadians who possessed limited knowledge of English. According to twenty-two percent of the participants, the inability of these students to communicate in English adversely affected the training provided. This group of graduates maintained that, in many instances, instructors were required to continually repeat material and discuss topics in a simplified manner.

Thirty-three percent of the graduates who responded considered this programme would have been more self-satisfying and valuable if options had been available in oriental, vegetarian and low calorie cooking. In addition to expanding the employment opportunities open to graduates, these students believed that such options would provide individuals interested in becoming professional cooks or chefs with a broad knowledge of the trade. In a similar context, one employer recommended that students intending to become marine cooks should be able to take a baking option so they could bake bread and prepare food for the crew of a ship.

Discussion. According to the graduates, who participated in the follow-up study, the short-order cook programme should be extended in length if students were to be adequately prepared for employment in the cooking trade. If more time was available , instructors would be able to provide more demonstrations, offer several options and discuss in greater depth the theoretical aspects of cooking. By introducing these changes,the learning experiences and training provided students would be improved.

Since a large proportion of the individuals attracted to the short-order cook programme are new Canadians, the College and Canada Manpower counsellors must ensure applicants are able to communicate adequately in English. If a class contains a large number of students who have difficulty with English, the training provided must be adversely effected since instructors are unable to progress at a normal rate. This situation, as the findings indicated, can create unnecessary discord among students.

Dental Technician

$N_s = 9$, $N_r = 6$, $R_d = 67\%$

Findings. Sixty-seven percent of the graduates, who returned the questionnaire, recommended that the programme should be extended in length so more time could be assigned to the practical aspects of the curriculum. By offering students greater opportunities for laboratory work, these graduates perceived prospective technicians would develop more competence in basic dentistry skills. There was also agreement among respondents that the curriculum needed to be widened in scope to include oral procedure and anatomy, subjects which they considered students should be familiar before entering an apprenticeship programme. In order to offer these new programmes, fifty percent of the respondents recommended that two separate programmes in dental technology be offered by the College.

Facilities and equipment, available for training dental technicians, were considered to be very inadequate by over sixty percent of the graduates who responded. In the opinion of this group,the shortage of apparatus, overcrowding and limited space lowered the quality of educational experiences offered. Thirty-three percent of the respondents stressed that the situation in existence was not the product of poor instruction. Most of the graduates, in fact, noted that the instructor who taught this course was an excellent technician. After graduating from College, fifty percent of the students reported that they had to search extensively for a dental laboratory willing to offer them an apprenticeship. In view of the small number of graduates and laboratories involved, the students considered the present hiring practices were very unsatisfactory.

Discussion. The responses of the graduates, who participated in the follow-up study, suggest that it would be beneficial to either extend the length of the present programme or offer two separate dental technician courses. Advances in technology, according to the instructor, have been considerable in this field during the past five years,which supported the graduates' recommendation that the curriculum needed widening in scope. If students are to be adequately prepared for employment as dental technicians, advances in technology must be included in the curriculum or the skills and knowledge they acquire will be out-dated.

Though shortage of space was common to all departments, the lack of appropriate facilities was especially acute in the dental technician programme. Under these circumstances, the investigator recommends, high priority should be placed on providing additional laboratory space for this programme. The present hiring practices of dental laboratories, as the students noted, are unsatisfactory in view of the small number of graduates seeking employment. This situation might be improved,in the investigator's opinion, by the College, Canada Manpower and Dental Technicians' Association establishing a clearing house for processing applications for apprenticeships.

Technical Division

Electro-Mechanics

$N_s = 13$, $N_r = 8$, $R_d = 62\%$

Findings. Seventy-five percent of the graduates, who returned the questionnaire, were very satisfied with the training they had received in this programme. In fact, fifty percent of the respondents stressed that a high quality of instruction had been provided. There was also general agreement among participants that the programme could be improved by slightly modifying the present curriculum. The respondents strongly recommended that more instructional time should be devoted to discussing job opportunities, conditions of employment and apprenticeship regulations in various sectors of the electrical industry.

Discussion. The training provided in the Electro-Mechanics programme appeared to adequately satisfy the expectations of most students who completed the course. There were recommendations, however, that the existing curriculum needed revising to include more discussion on conditions of employment, job opportunities and apprenticeship regulations. The responses of graduates indicated that many individuals accepted the first position they were offered after leaving College. This action frequently resulted in a number of graduates seeking new employment soon after accepting this initial position. If students were provided with adequate vocational counselling while attending College, the movement of graduates from one job to another, during their first year after leaving College, would be considerably reduced. According to a number of respondents, the length of the programme should be extended. If this occurred, students would be provided with more time in which to better comprehend the material taught in class. Furthermore, the number of laboratory periods could be increased which would enable individuals to attain a higher level of competence in basic electrical skills.

Electricity and Industrial Electronics

$N_s = 12$, $N_r = 9$, $R_d = 75\%$

Findings. Seventy-eight percent of the graduates, who responded in this programme, indicated they were dissatisfied with the training they received and the learning environment in which it was provided. According to a large proportion of these graduates, less emphasis should have been placed on personal appearance and more attention devoted to providing students, who had difficulty understanding the subject matter, with greater individualized instruction. The unsatisfactory learning environment was aggravated, according to thirty-three percent of the graduates, by incompetent substitute teachers being employed at the beginning of the course. These temporary instructors were perceived by respondents to have merely performed a 'baby-sitting' function.

The curriculum was also criticized by sixty-seven percent of the respondents as being out-dated in a number of areas. This situation in their opinion, could be improved if faculty members familiarized themselves with recent advances in the trade and periodically evaluated the material taught to ensure it was pertinent in the industrial setting. One respondent was especially displeased that before entering the programme he had not been informed of a union policy which limited the number of new apprentices entering the trade every year. Based on several enquiries for employment, he estimated that only one out of every four graduates could expect to become a journeyman.

Discussion. Since the majority of graduates, who responded in the follow-up study, were very dissatisfied with the learning environment and vocational training they received, a committee should be formed to examine the programme curriculum, discuss the criticisms expressed by students and arrange for more individualized instruction. College and Canada Manpower counsellors should be provided with ample information about the content of the course, nature of class assignments, present union policies and conditions of employment in the electrical trade. Prospective students, prior to seeking admission into the programme, would then be fully aware of their future career prospects and the amount of studying they would be required to complete. Tha availability of this kind of knowledge would prevent students finding, half-way through their training, that the programme was not satisfying their pre-entry expectations or career aspirations.

The Technical Division should critically appraise the present policy for hiring temporary staff and consider adopting a procedure which ensures new students are taught by a full-time instructor during their first two months at College. Since individuals are often insecure in a new environment, it is very important that they quickly find a member of staff to whom they can relate. Furthermore, the climate of a class, inter-personal relationships and student cliques are also usually established during this period. In view of these outcomes; it is essential that new students are provided with sound instruction at the beginning of this programme.

Drafting

$N_s = 28, N_r = 21, R_d = 75\%$

Findings. The training provided by the two drafting programmes, examined in this study, was assessed as being excellent by eighty-five percent of the respondents. These graduates reported that the basic skills and knowledge provided in the programme equipped an individual to function effectively as a junior draftsman in a variety of industrial setting. Fifty-two percent of the graduates, however, perceived this quality of training could not be maintained unless the programme was extended to two months. This group considered it was impossible for instructors to discuss and examine the implications of new advances occurring in different industries in the present ten month period.

One major criticism of the programme, expressed by twenty-four percent of the graduates, was that students were allowed to enroll who lacked ability, motivation and interest which retarded the general progress of the class and lowered the quality of training. Though the instructors appeared very casual and at ease with their students, twenty-four percent of the graduates maintained that the programme could be slightly improved by faculty members employing less formal and structured methods of instruction.

The immediate supervisors of the graduates were equally very satisfied with the training offered in this programme. The only recommendation this group proposed for improving learning experiences was extending the programme so students could be offered more options and certain major topics examined to a greater depth. The employers' assessment of this programme was summarized by one supervisor who stated, during a telephone conversation with the investigator, that "instructors in the Drafting Department are practically oriented, field trained professionals who are aware of what is needed in the trade".

Discussion. Both the graduates and employers appeared very satisfied with the training provided in the drafting programme. However, there was some concern, among graduates, that the present quality of training would not be maintained in the future without the programme being extended in length. If instructional time was increased, more options could be offered, advances in different industries discussed in greater depth and more individualized instruction provided. The potential benefits arising from an extension of the programme warrants this issue being studied further.

A number of graduates perceived that individuals were being admitted into the programme who were unsuitable for this highly specialized form of training. In view of the special artistic, mathematical and perception talents needed to become a professional draftsman, College and Canada Manpower counsellors should ensure that individuals admitted to the drafting programme possess the necessary requirements to cope with assignments and comprehend the material taught in class. A better screening procedure would be beneficial, in the investigator's opinion, to prospective students, graduates, employers, and instructors. There was evidence that better lines of communication need to be established between instructors and the counsellors who recommend individuals to enter the drafting programme.

Social Activities

$N_s = 178$, $N_r = 114$, $R_d = 64$ %

Findings. According to sixty percent of the graduates, who participated in the follow-up study, social activities at Vancouver Vocational Institute were virtually non-existent. Though ten percent of the graduates indicated that they had attended college solely to secure vocational skills, over fifty percent maintained social activities were an important and integral part of their college education. Forty percent of the respondents reported that they were rarely informed what was taught in other departments or encouraged to associate with students from different programmes. Several supervisors, who had themselves attended the Institute, agreed with the students that the College should be offering more opportunities for students to develop socially.

Discussion. The isolationism characterizing departments, which faculty members appeared to encourage, according to these findings,was neither supported nor viewed as being beneficial by the students. By establishing a comprehensive social programme,students in different departments would be able to become better acquainted. Furthermore, student-staff relations would be improved if opportunities for greater social interaction between the faculty and students were provided. Though the short duration of programmes, continuous 'in-take' policy and students attendance at class for six hours a day tend to limit social activities, the present situation could be considerably improved by a committee of students and staff jointly planning special social events within the institution's constraints.

Student Services

$N_s = 178$, $N_r = 114$, $R_d = 64\%$

Findings. In general, respondents were very dissatisfied with the student services provided by the College. Almost twenty-five percent of the graduates reported that they were virtually non-existent. Library facilities, for example, were considered to be totally inadequate for the student population, especially now that they were being shared with the computer science programme. The placement of a computer installation in the library, according to the respondents, generated a continuous flow of students through the room which made private study impossible. Furthermore, fifteen students noted that the library was often closed outside of normal class hours when many students might want to use the facilities.

Though a list of accommodation was reported to be available for students from out of town twenty participants who had enquired about the list in the Counselling Department had found it unavailable. Over forty percent of the graduates considered the guidance and counselling facilities to be inadequate. These respondents maintained that the majority of counsellors were mainly concerned about admitting students rather than providing vocational counselling, assisting individuals resolve personal problems, and obtaining information on job opportunities. Similarly the Canada Manpower Office inside the College as well as others located throughout the Lower Mainland area were fairly severely criticized for not adequately counselling students. In the opinion of thirty-six percent of those graduates who returned the questionnaire, Canada Manpower counsellors needed to be better informed about course prerequisites, employment prospects and the contents of programmes.

Though the majority of respondents considered the food provided by the cafeteria was excellent, thirty-one percent were annoyed with having to compete with the general public for space in the dining room. The major source of this dissatisfaction was that most students were only granted half an hour for lunch which was considerably reduced if they had to queue for a meal.

Discussion. The comments of the participants suggest that the student services at the College need to be improved, as soon as possible, if students are to be provided with adequate study facilities, living accommodation, and personal counselling. The quality of student services, according to the literature reviewed, have a significant impact on whether an individual continues his studies, progresses satisfactorily in his training, and fulfills his occupational aspirations . Lines of communication need to be improved between the College and Canada Manpower so counsellors in both organizations are better informed about course prerequisites, employment prospects, union practices and contents of programmes. Without information of this kind assisting individuals select future careers becomes a trial and error process. Since many of the students who attend Vancouver Vocational Institute are adults with family responsibilities, adequate personal counselling should be available at all times. According to the literature reviewed on dropouts, many students discontinue their studies for personal reasons which a sensitive counsellor might assist them resolve.

College Organization

$N_s = 178$, $N_r = 114$, $R_d = 64\%$

Findings. Though the majority of graduates were satisfied with the general organization of the College, twenty-eight percent of the respondents reported that attending the Institute was more like working in a factory than going to school. These conditions, in the students' opinion, created a rather cold and impersonal atmosphere. The shortage of space and overcrowding in most departments also disturbed many students, though none of them proposed any suggestions for improving this situation. Finally, forty-two percent of the graduates reported that the College needed to publicize more widely the services it offered, since they had been unaware of the diversity of programmes available at the Institute prior to visiting a Canada Manpower office.

The major criticism of employers was that the College needed to improve its public relations with the commercial, business, and industrial communities of the Lower Mainland region. During the follow-up study twenty-four administrators informed the investigator that they possessed little knowledge of the programmes offered by the Institute.

Discussion. Though the learning experiences provided at Vancouver Vocational Institute are mainly of a vocational nature, the administrators and faculty members should not overemphasize the trade training aspects of programmes to the detriment of a student's general education. Student morale, motivation, and progress are influenced according to the literature surveyed, by the atmosphere and environment in which educational experiences are being offered. Therefore, an effort should be made by the staff to eliminate the cold and impersonal atmosphere existing in the Institute. Since the isolationism existing among the departments disturbed a large proportion of the respondents, visitations between departments, informal gatherings and social activities should be arranged. These activities would provide students with the information they desire about the programmes offered by other departments. Also there would be ample opportunity for students from different departments to socialize.

III CONCLUSIONS

Based on the findings yielded by analysis the investigator was able to arrive at some tentative conclusions regarding the activities and achievements of Vancouver Vocational Institute in the areas studied.

1. The students, employers, and faculty generally perceived that the programmes offered by the College had a strong vocational orientation that they considered should be maintained. The social aspects of education were viewed as being given less priority which they viewed as being unsatisfactory. Both employers and faculty perceived that more emphasis should be placed on programme goals concerned with critical thinking, creativity, and problem solving, suggesting that they considered students needed to develop a level of flexibility which would enable them to cope more effectively with the changing demands of industry.
2. The students, faculty, and employers differed in their evaluations; a substantial discrepancy was perceived to exist between the magnitude

of the present and preferred importance of the programme goals by all three groups. Based on these findings it was concluded that all participants perceived most of the specified programme goals should be given more emphasis in the future.

3. Although all respondents considered instructors were interested in their welfare,graduates from the Business Division ranked lower than any other group of students the instructional related dimensions of the learning environment. Furthermore, this group of graduates perceived that the instructors by whom they were taught provided students with insufficient individualized instruction. The dropouts' overall assessment of the learning environment was lower than that of the students who graduated, however, they ranked high the same dimensions as most graduates. Preparation for a job and assistance in finding employment were considered by the majority of respondents to have been given less emphasis in their programmes than most of the dimensions.

4. In general,students were very satisfied with the vocational training provided in the programmes studied. Although variations in assessment occurred the training in none of the skills were evaluated less than satisfactory. The responses of employers indicated that they were even more satisfied than the students with training. Therefore, Vancouver Vocational Institute was considered by the clientele it served to be providing a high quality of vocational training.

5. The responses of the graduates and dropouts seemed to indicate that instructors in their efforts to provide students with the basics of a specific occupation tended to present material in a rather uninteresting manner. Furthermore, dropouts were generally less

satisfied with the instructional practices of the faculty than the graduates. These situations were, in the investigator's opinion, due to the instructors having insufficient time in which to cover the necessary subject matter.

6. Most graduates were very dissatisfied with the student services offered by the College. Library facilities, in addition to being inadequate for the student population, were shared with a computer science programme which resulted in space for private study being in short supply. The Guidance and Counselling Department was perceived by graduates as being mainly concerned with admissions rather than vocational and personal counselling, which many individuals indicated they would have utilized if they had been available. Furthermore, out-of-town students reported that they were provided with minimal assistance in finding accommodation by the Guidance Department.
7. Social activities at Vancouver Vocational Institute were virtually non-existent which was partially due to the faculty's perception that social events should occur outside the confines of the Institution. This viewpoint, however, was not shared by the majority of the graduates, who considered that social activities were an integral part of their post-secondary education.
8. Though the College was considered well organized, many graduates reported that it functioned more like a factory than an educational institution with departments operating in isolation. This practice, in their opinion, created a rather impersonal atmosphere and discouraged student interaction. Shortage of space and overcrowding were environmental factors that were viewed as having a detrimental effect on the training provided.

9. Many of the graduates perceived that insufficient individualized instruction was being provided in the programmes they attended. Therefore students often progressed to more advanced theory before they possessed an adequate understanding of the basic concepts. If programmes were lengthened respondents perceived more options could be offered, basic topics could be discussed to a greater depth,and students would be able to retain a greater quantity of the subject matter taught.

CHAPTER VII

SUMMARIZATION, CONCLUSIONS AND RECOMMENDATIONS

I AN OVERVIEW OF THE STUDY

The Rationale and Purpose

As our society becomes more complex and technologically oriented, adults are finding that continuous education is becoming an essential feature of life, if they are to adequately cope with the demands of an ever changing environment, effectively utilize increased leisure time, find productive employment and function as a responsible citizen. To assist people become more resilient to economic, political, cultural and social pressures, community colleges have expanded and diversified the programmes they offer. In response to public demand that opportunities for a post-secondary education be expanded to a larger proportion of the population, community colleges have accepted a greater degree of responsibility than ever in the past for shaping the future direction and development of the nation's economy.

Community colleges, due to their attractiveness to the general public, politicians and government officials, have enjoyed a favorable position in the nation's education system which has protected them against fluctuations in the economy. Recently, however, community colleges have found that governments request them to justify requests for additional financial support, critically analyze their operations and measure the effectiveness of the programmes they offer. This situation is mainly due to the present extended period of inflation, which has resulted in demands for government assistance from the private and public sectors of the economy increasing both in quantity and frequency.

In attempting to satisfy government demands for greater accountability, community college administrators have discovered that relevant information on the activities of their institutions is scarce, due in many instances to a deficient information system. Evidence seems to indicate that the present uncertain economic conditions will continue for some time in the future. Therefore,community colleges can expect demands for accountability to intensify. If the colleges are to adequately satisfy these demands, administrators must give serious consideration to improving the quality of information available for policy analysis, planning,and decision-making.

The purpose of this investigation was to develop a programme information system capable of providing community college administrators and faculty with better quality information than is presently available. Through the application of the system the study illustrated the kinds of surveys and analysis that could be conducted by users.

Delimitations

Though Vancouver City College offered a wide variety of programmes through its four campuses, limitations of time and resources necessitated the scope of the investigation being delimited to twelve programmes, of ten months or less in duration, offered by the vocational campus. Therefore only students, employers,and faculty members associated with these programmes participated in the study. No consideration was given to the concerns, suggestions,and assessments of any other group.

Limitations

Due to the developmental nature of this investigation none of the procedures, methodologies, or instruments employed were considered permanent, but rather as elements of a process for designing an effective programme information system for community colleges. Under these conditions any findings arising from the application of the system must be viewed as provisional indicators of the existing state of affairs, since subsequent modification in the system or involvement of different samples could result in these findings being modified.

An Overview of the System

The development porcess employed in this study, to design a programme information system, was based on a methodology proposed by Hussain consisting of five major stages, namely:

Stage I	Feasibility Study
Stage II	Determining System Requirements
Stage III	Systems Design
Stage IV	Test Solution
Stage V	Redevelopment

In order to complete each stage a series of activities had to be completed. In this investigation these events were flow-charted to specify the order in which they occurred and identify the relationship among them.

Due to the numerous restrictions under which community colleges must now operate, the following criteria were established for designing the system: (1) inexpensive to install; (2) easy to implement; (3) simple to operate; (4) quickly modified; and (5) useful data generated. These criteria were partially satisfied, in this investigation, by utilizing whenever possible, existing facilities, resourced and personnel. Also, emphasis was placed on minimizing modifications of existing administrative procedures and involving a representative cross-section of the college's clientele and faculty in the developmental process.

Conceptual Framework

Employing a systems approach Clarke, Konrad, Ottley and Ramer, at the University of Alberta, developed a conceptual framework which mainly originated from the writings of Stufflebeam and Parsons. Their framework for obtaining data systematically on the clientele and faculty of a community college consists of the following dimensions: (1) evaluation-class; (2) organizational subsystem; (3) evaluation mode; (4) treatment of data; and (5) student flow. This systems model was integrated into the development process, during the design stage, to serve as the base for generating data.

By performing this key function, the conceptual framework of the 'synthetic model' established the limitations of the programme information system. The model's components were of sufficient scope, however, that it was possible to develop a system capable of studying a wide range of problems in a variety of educational settings. Also, this systems model provided a structure for studying the educational process of an institution at different periods of time, which facilitates the investigation of interrelationships among process elements.

The Methodology

Population and Sample

Though the samples for study were not selected by a random procedure, the data gathered revealed that members of a sample chosen from a specific division possessed a number of common characteristics. Therefore, for statistical purposes, the samples used were considered to be representative of a division's broader population.

Data Gathering Instruments

Several multiple-choice questionnaires were employed to gather context, input, process and output data from students, employers and faculty members as students flowed through the system. Prior to an instrument being administered a pilot-test was conducted to assess its reliability and validity. As a result of the feedback obtained during these trials all instruments were modified to some degree before being utilized. Since a multiple-choice format limits responses, 'open-ended' items were intended to enable participants to express more fully their opinions and judgments.

Data Gathering Process

The data needed to conduct this study were gathered in three stages in accordance with the student flow schema of the'synthetic model'. Due to a continuous intake policy many of the tasks involved were performed more than once, which resulted in the gathering of data being completed in four phases. The complexity of the process was considerably reduced by tasks and related activities being represented in a PERT chart. Activity paths were employed in the network to separate the tasks performed by different groups and to identify the sequence in which they were undertaken. This procedure facilitated data being gathered quickly, efficiently,and with minimal disruption of class schedules.

Data Analysis

Though the programme information system was capable of generating data to study a wide variety of issues related to a college's clientele and internal organization, the limitations to which the investigation was subjected resulted in analysis being delineated to studying five areas, namely: (1) programme goals; (2) learning environment; (3) vocational skills; (4) instructional practices; and (5) recommendations for improvement. These areas were selected mainly on the basis of the user's needs identified in the feasibility study. The constraints to which the investigation was subjected resulted in analysis being further delineated to studying differences among occupational divisions in the specified areas. The flexibility of the system was demonstrated by providing illustrations of the kind of analysis that could be undertaken at a divisional level.

Significance of the Study

If community colleges are to continue democratizing post-secondary education better quality information must be available to administrators, so they can effectively cope with greater demands for accountability, the adverse effects of inflation, a more complex organization and growing demand for skilled labour. The programme information system developed in this study offers community colleges a simple, flexible,and inexpensive system for generating the data administrators so urgently need. Furthermore access to more recent, detailed and accurate data would assist faculty members to adjust smoothly to the new pressures and challenges that community colleges are going to experience in the near future.

II FINDINGS

The Development Process

Feasibility Study

Objective 1.0: To establish whether a programme information system would be of value to community college staff.

Prior to conducting the feasibility study a review of the literature disclosed that many comminity colleges had limited information at their disposal regarding the clientele they served, effectiveness of programmes, efficiency of operations,or the scope of functions. At Vancouver Vocational Institute, the college selected for conducting this investigation, a departmental information system had evolved over the years for obtaining information on students. Due to inconsistencies in the procedures employed, the quality as well as the quantity of data gathered varied considerably from one department to another.

At a college level information was gathered from prospective students when seeking admission to the institution. Further enquiries, however, revealed that only fee payers were involved because Canada Manpower sponsored students were interviewed at an external agency. Though there was a similar provision for securing feedback from students after graduation, discussion with faculty members disclosed, only a small number of former students ever responded. The present information system serving the college appeared very inadequate for its data needs. This observation was confirmed by both administrators and instructors who maintained that many issues confronting the College were not being resolved partly due to a scarcity of relevant information.

After the generalizability of the proposed system had been established, the resources required for developing and pilot-testing the system were identified and compared with the economic, organizational, technical, and human constraints existing in the College. The constraints that appeared might adversely effect the study were the College's history of minimal organizational change, the reluctance of certain faculty members to participating in research, and the faculty's general skepticism of academic issues. The feasibility study indicated that the success of the investigation would depend, to a significant degree, upon good rapport being established with the faculty and ample opportunity for instructors to become involved in the development process.

Determining the User's Needs

Objective 2.0: To determine the user's requirements of the programme information system

Interviews with twenty-seven faculty members selected at random from those associated with the programmes reviewed, disclosed that the faculty were in general consensus that more detailed information was needed on students before or soon after they commenced their studies. This need was perceived as arising from the 'open-door' policy supported by the College, which allowed an individual to enter any programme of his choice if space was available and he possessed the basic prerequisites. The instructors maintained that due to this policy, a large number of individuals were entering programmes for which they neither possessed the academic background, personality, or interest.

The faculty interviewed also indicated they would be interested in discovering whether graduates secured the type of employment for which they had been trained, how satisfied they were with their training, and whether they had any suggestions for improving the programmes offered by the College. Though most interviewees reported that they were in continuous contact with their colleagues in the trade, there was general agreement that more feedback from employers would be useful.

When questioned about programme goals most faculty members noted they were not specifically stated in writing but rather set by an individual's standards of excellence. Most instructors considered this criteria to be satisfactory. A number of faculty members involved in curriculum development, however, conceded that a clear definition of programme goals would have been very valuable in resolving many problems they encountered completing these tasks.

System Design

> Objective 3.0: To design a simple, flexible and inexpensive programme information system for dealing with issues related to community college programmes.

The development process proposed by Hussain was successfully employed in this investigation to design a programme information system for a small community college capable of identifying user's needs, general relevant data,and disseminating findings. Furthermore,the integration of the 'synthetic model' into the system provided an ideal framework for gathering data as students flowed through an institution.

The personnel, computer facilities,and duplicating services at Vancouver Vocational Institute were sufficient for developing and pilot-testing the system; as a result expenditures incurred by the College were minimal. The largest cost item was postage, which could only have been reduced by diminishing the sampe size.

The administration of the first questionnaire revealed that the time needed for it to be completed by students varied considerably from one programme to another. At one extreme students in a drafting programme required less than twenty minutes, while at the other those in a waiter-waitress's programme required nearly an hour. The data gathered suggested that this situation was due to many students in the latter programme being new Canadians. Though these individuals were highly motivated they often had difficulty understanding the items on the questionnaire because of their deficiency in the English language.

An instructors' attitude towards the study was found to influence the willingness of their students to provide the information requested. If an instructor expressed skepticism regarding the relevance of a specific data element, students tended to avoid answering the related item on the questionnaire. By encouraging questions this anxiety was considerably alleviated.

The responses of students and employers in the follow-up surveys were greater than expected and considerably higher than average rates reported in the literature. This occurred in the investigator's opinion because adequate rapport was maintained with students throughout the study, the various phases of the follow-up surveys were carefully planned and participants were made to feel that their opinions were valuable. A study of the returned questionnaires revealed that graduates from programmes where an instructor had been skeptical of the investigation tended to omit more items than respondents from other programmes. This finding emphasized the magnitude of an instructor's influence on the behavior of students after leaving college.

Organizational Change

Objective 4.0: To investigate changes in organizational procedures necessary for the information system to become operational.

Since the programme information system developed in this investigation was designed to utilize whenever possible existing personnel, facilities,and resources,the actual organizational changes needed for it to become operational were minimal. Most of the tasks involved in the data gathering process were assigned the responsibility of either the permanent office personnel or temporary staff hired for that purpose.

Redevelopment

Objective 5.0: To examine how continuance of the programme information sytem might be insured after pilot-testing.

The literature reviewed reported that for an innovation to become stabilized and self-renewing adequate consideration needed to be given:

1. Continuing reward
2. Practice and motivation
3. Structural integration into the system
4. Continuing evaluation
5. Providing for continuing maintenance
6. Continuing adaptation capability

An innovation is stabilized by these factors because they provide positive reinforcement, continuous evaluation,and opportunities for participation in decision-making by users. Since the faculty of Vancouver Vocational Institute tended to support the maintenance of the organization's present equilibrium state, there were clear indications that the internalization of the system would be difficult without the existence of a redevelopment team. By establishing a committee of this kind the practices suggested, in the literature, for stabilizing an innovation could be implemented. Also faculty members would be offered an opportunity, that had not been widely available in the past, to become involved in directing coordinating and planning the future of the institution.

Application of the System

> Objective 6.0: To illustrate how the data generated by the programme information system could be utilized to study areas of interest to a college.

Programme Goals

According to the data analyzed, on present goals, both students and employers were in common consensus as to the high and low goal priorities of the College. At present they perceived programmes had a strong vocational orientation with minimal consideration being given the social aspects of education. Though the faculty ranked certain goals in a similar order to the students and employers, their perceptions differed to some extent. A comparision of the three groups' rank ordering of goals, however, yield a fairly high correlation coefficient that suggests all participants were in general agreement as to the emphasis that was presently being placed on the specified set of goals.

When asked to report the emphasis the College should be placing on the specified goals, the students ranked them in a similar order of priority as before. Though the priorities of employers differed to some degree from that of the students, they also indicated that the vocational orientation of programmes should be maintained. The employers' ranking of the goals suggested that they wanted the College to assist students more in developing their creative, critical thinking and problem-solving abilities. Similar preferences were expressed by the faculty.

When the responses of students were compared substantial discrepancies were found to exist between the magnitude of the present and preferred importance of the programme goals. Furthermore, similar discrepancies were found in the other groups, though the difference between faculty members' responses were smaller than either the employers or students.

Statistical analysis of participants' assessments of what emphasis the College 'is' placing on the specified goals disclosed that there was a significant difference among the groups. A Scheffe test, however, revealed that the difference was between the employer's overall evaluation and that of the students and faculty. Analysis of the three groups' assessments of what emphasis 'should be' placed on the goals revealed that a significant difference existed between the overall assessment of the faculty and that of the clientele.

Learning Environment

The priority ratings of the graduates from the Business Division suggested that though they perceived instructors were interested in their welfare, insufficient individualized instruction was being provided. The graduates from the other divisions and dropouts in contrast appeared generally more satisfied with the instruction related dimensions.

Analysis of variance indicated that there was a significant difference among the four groups' overall evaluations of the learning environment. Further analysis of Scheffe's test of difference disclosed that dropouts tended to be less satisfied with the learning environment than graduates. Similarly graduates from the Business Division appeared less satisfied with the learning environment in which they received their training than their peers who graduated from the Service Division.

Vocational Skills

The graduates and dropouts were found to be in agreement as to which of the vocational skills were being emphasized the most in the programmes they attended. The skills ranked highest by most participants were:

1. Ability to accept and follow instructions;
2. Being in regular attendance;
3. Mastery of technical skills;
4. Readiness to accept responsibility.

These responses emphasize the perceived importance of basic skill development in semi-skilled and technical occupations.

Though the students ranked low in value similar skills, there was a difference in the order that appeared to reflect variations in the orientation of programmes. In contrast to other participants, graduates from the Service Division ranked low 'mastery and technical skills', and 'developing relationships with colleagues and the public', which suggests that less emphasis was being placed on these skills by the faculty than some of the others under consideration. However, in nearly all the skill areas the mean satisfaction scores of Service Division graduates were higher than those of other students, which implies they were generally more satisfied than their peers with the vocational training offered.

A study of participants' overall assessments of the vocational training provided, revealed that the assessment of dropouts was in most instances lower than those of graduates. Except for three skill areas dropouts' evaluations were high, suggesting they were fairly satisfied with the training provided. Though the evaluations of Business Division graduates were generally higher than those of the dropouts, they appeared less satisfied than the other graduates with the vocational training they received. This observation was confirmed by statistical analysis.

Both graduates and employers perceived considerable emphasis was being placed by the College on the following vocational skills:

1. Being in regular attendance
2. Ability to accept and follow instructions.

Discussions with employers revealed these factors were often the cause of graduates being dismissed soon after being hired. The vocational skills the clientele perceived as being emphasized the least were:

1. Express creativeness
2. Exhibit initiative

In previous analysis, however, the employers indicated that more emphasis 'should be' placed on these skills, which suggested that the College was not providing adequate training in these areas. The employers' overall assessment of the skill areas was higher than that of the graduates, implying that they were generally very satisfied with the vocational training provided by the College.

Instruction

Graduates from the Business Division ranked highest the human relation practices of the faculty, suggesting that they perceived the instructors were interested in their general welfare. A similar evaluation had been expressed by the graduates when they assessed the learning environment. At the other end of the continuum, these graduates indicated that they were least satisfied with the manner in which material was taught and the lack of opportunity for them to become involved in determining programme objectives. Both the dropouts and graduates from the other divisions rated high the practices noted by Business Division graduates,however, the former in contrast to the latter considered the majority of instructors by whom they were taught treated in depth the theory of the trade they were studying.

The other participants agreed with the graduates from the Business Division that students were not encouraged to participate in decision-making. Furthermore, they indicated that subject matter in their programmes was often presented in a rather uninteresting manner. Statistical analysis confirmed that students, irrespective of their status or division, ranked the instructional practices similarly implying that common instructional practices were employed by instructors throughout the College.

Business Division graduates' overall assessment of the instructional practices was lower than that of graduates from the other divisions, suggesting that the former were more satisfied than the latter with instructional practices of the faculty by whom they were taught. Similarly, dropouts were less satisfied than graduates with the instructional practices of the faculty. The low evaluation assigned certain practices by most participants, suggested that these areas need to be improved.

Recommendations for Improvement

Since a variety of suggestions was posed for improving the programmes and services offered by Vancouver Vocational Institute, only those considered to be of major importance have been reported.

Programmes

Business Division

Commercial Basic. Graduates from this basic secretarial programme maintained that insufficient attention was being given to the individual needs of students. There was general agreement among the graduates that there should be provision for students to continue their studies beyond the present period of four months.

Commercial Secretarial. Though most graduates proposed no recommendations for improving programmes, a number were dissatisfied with the equipment upon which they were trained. Several graduates suggested that existing programmes could be improved by offering a practicum, which would expose students to the realities of working in an office.

Medical Office Assistant. Many graduates from this programme recommended that instructors should ensure that students possess a sound understanding of basic concepts before encouraging them to undertake more advanced training. In addition several graduates proposed that more visits should be arranged to doctors' offices and medical centres.

Medical Stenographer. Both graduates and employers were very satisfied with this programme, the only criticism raised being that students were expected to absorb a large quantity of material in a short period of time.

Service Division

Beauty Culture. Though graduates were pleased with the basic structure of this programme, many considered that the elementary skills and knowledge taught did not adequately prepare students for an apprenticeship. There was general agreement that more opportunities must be provided for students to learn creative styling and develop individual techniques of their own. A number of graduates maintained that the beauty salon was operated more like a business than learning centre, which they considered had a detrimental effect on certain aspects of the training.

Waiter/Waitress. The waiter/waitress programme was considered by the majority of graduates to provide worthwhile experience. There was general consensus that if the programme was extended certain aspects of the curriculum could be examined more extensively, which would better prepare students for employment.

Short-Order Cook. Though the quality of instruction offered in this programme was considered by graduates to be excellent, there was general agreement that insufficient time was available for students to fully comprehend the basic theory of cooking or acquire the necessary practical skills. A number of graduates suggested that individuals seeking admittance into the programme should be required to provide evidence of competency of the English language, because the language deficiency of fellow students, in their opinion, adversely affected the training provided.

Dental Technician. Most graduates considered the Dental Technician programme should be lengthened so students could be given more opportunity to develop practical skills. In addition, they considered the scope of the curriculum should be broadened. Finally, the facilities and equipment were viewed as being completely inadequate for the number of students being trained.

Technical Division

Electro-Mechanics. The majority of graduates from this programme were very satisfied with the training they received; in fact, several commented on the high quality of instruction offered. Respondents generally felt more time should have been devoted to discussing job opportunities and other employment-related topics, so students would be better prepared for selecting their first positions.

Electricity and Industrial Electronics. The majority of graduates were rather dissatisfied with the training they received in the Electricity and Industrial Electronics. There was general consensus among graduates that personality conflicts and differences in values had been allowed to adversely effect the training provided by the College. Further, it was reported that the course should have been more flexible and methods of instruction less formal. A number of graduates did not appear to be adequately informed prior to commencing the programme about course content, job opportunities, and union practices, which resulted in their having misconceptions regarding the programme.

Drafting. The training provided in the two drafting programmes was assessed as excellent by the majority of graduates and employers. Several graduates, however, maintained that they doubted whether the quality of the programme could be sustained, unless it was extended by two months. At present they perceived there was a growing need for more options, as well as time for certain topics to be discussed to a greater depth, if students were to be prepared to adequately cope with recent advances in industry. A better screening of students was recommended by a number of graduates, who considered that their less able, lower motivated, and insufficiently interested colleagues had a detrimental effect on the programme.

Student Services

In general students were very dissatisfied with the student services provided at the College, the only exception being the dining facilities which were considered to be excellent, though even they perceived could be improved by regulating the admittance of the general public. Library facilities were reported as being totally inadequate, especially since space was shared with computer science.

The guidance and counselling services were viewed, by a large number of graduates, as being poor due to the staff being over-concerned with admitting prospective students rather than providing them with vocational counselling and assisting them resolve personal problems. Respondents who resided out of town before entering College reported that they were provided with no assistance in securing temporary accommodation.

Social Activities

According to the majority of respondents social activities at Vancouver Vocational Institute were non-existent, a situation which they thought was very unsatisfactory, since social activities, in their opinion, were an important part of college education. A comprehensive social programme they perceived would have enabled students and faculty from the divisions to become better acquainted. There was a general consensus that students within a department were never provided opportunities to associate informally with other individuals attending the College.

College Organization

Though graduates appeared satisfied with the organization of the College several did report that attending Vancouver Vocational Institute was similar to working in a factory rather than attending an educational institution. This organizational practice, in their opinion, tended to create a rather impersonal atmosphere. Shortage of space and overcrowding in most departments concerned students, since they perceived these conditions adversely effected the quality of training. Many graduates emphasized that the College needed to publicize more widely the services and programmes it offered, because while attending high school they had never been informed about the activities of Vancouver Vocational Institute.

III CONCLUSIONS

Subject to the constraints and limitation under which this study was conducted the investigator was able to establish some tentative conclusions from the findings:

The Development Process

Feasibility Study

1. The feasibility study facilitated the identification of resources necessary to develop, pilot-test, and evaluate the programme information system. Furthermore it enabled the resource requirements of the system to be compared with organizational constraints.
2. Areas of concern to students, employers, and faculty members were delineated and precisely defined by undertaking a feasibility study, which offered insights and suggestions as to the type of data the system should generate.
3. A feasibility analysis established whether the processes constituting the programme information system were generalizable and viable undertakings.

User's Needs

4. By employing systematic procedures for identifying user's needs, community college personnel were provided with a greater opportunity to direct and shape the future of the college they serve. This increased involvement in decision-making enhances the professional development of the staff, establishes a conducive climate to change and secures staff commitment to institutional policies.
5. Through involving users in establishing data files, relevant information for examining the problems confronting the personnel of a college would

be generated, which facilitates more effective strategies for their resolution being proposed.

System Design

6. The development process and conceptual framework employed in this investigation were found very effective for developing a programme information system capable of initiating a feasibility study, identifying users' needs, generating relevant data, and establishing procedures for its internalization in an institution.
7. Since new Canadians with limited knowledge of the English language and students without high school diplomas are attracted and encouraged to attend community colleges, adequate time must be provided for them to answer items on a questionnaire during the data gathering process.
8. In order for students to provide the information needed by a college all instruments should be written in language they can comprehend with minimal difficulty.
9. During data gathering in classrooms instructors should be requested to avoid influencing students responses by their personal bias, since the findings indicated that a faculty member's attitude towards this investigation influenced the response rates of the students they taught, even after they had graduated from college.
10. In order to secure high response rates in follow-up studies this investigation revealed: establishing good rapport with participants must be given adequate consideration; designing instruments that require minimal time and effort to complete; ensuring respondents are aware that their involvement is very important; and developing systematic procedures for recording returns.

Organizational Change

11. The programme information system developed in this investigation could be operationalized with few modifications to an organization's present structure and at minimal expense as a result of existing resources, facilities and personnel being utilized whenever possible.

12. The introduction of the system into a college, similar to most innovations, would generate some faculty resistance, however,the opportunities available for administrators, faculty members,and support staff to become involved in its conception, maintenance, evaluation and future development, should considerably reduce the intensity of this resistance and transfer negative forces to more positive efforts.

Redevelopment

13. Though the programme information system developed in this study was shown to possess considerable potential for generating relevant data for decision-making at a community college level, further trials are warranted to substantiate its usefulness and improve its effectiveness.

14. The introduction, maintenance and impact of the programme information system in a community college would to a significant extent depend upon the efforts, enthusiasm and professional skills exhibited by the redevelopment team. Without the support of this internal change agency the continuance of the system would undoubtedly be uncertain in an institution. Therefore,it is important that the members of this team be representative of a college staff.

Applications of the System

15. The five areas examined in the application of the system at Vancouver

Vocational Institute illustrated the usefulness of better quality data, identified the strengths and weaknesses of programmes, suggested strategies for improving the learning experiences offered students and enhancing the public relations of the College.

16. Analysis of the data generated by the system revealed that the vocational training provided by Vancouver Vocational Institute could be improved by a more rational decision-making approach being adopted by the administration and faculty to study issues that are preventing the institution from functioning at its maximum potential.

IV RECOMMENDATIONS

The Development Process

Though the programme information system developed in this study was found effective, further pilot-tests are warranted to eliminate certain deficiencies and confirm its generalizability. During these experimental applications of the system adequate attention at all times must be devoted to maintaining good rapport with the faculty and establishing a satisfactory relationship with the clientele of the college. Failure to secure the support and cooperation of participants in future trials would seriously jeopardize the system's effectiveness, acceptance,and continuance.

Prior to the information system being introduced in a college, even on a trial basis, the investigator recommends that a comprehensive feasibility study should be conducted so as to identify potential sources of resistance and assess the impact of constraints to which the organization is subjected. Furthermore,such a feasibility study discloses whether adequate physical, financial, and human resources are available for introducing the system, thereby preventing resources being unnecessarily wasted and organizational procedures disturbed.

Through a feasibility study issues of concern to administrators and faculty members should be identified and the files established in this investigation examined to determine whether they contain the necessary data. If specific elements are not on file the instruments presented in the Appendices should be revised so the appropriate data can be gathered. In the investigator's opinion the involvement of administrators, faculty members,and even support staff in the initial stages of the development process is very important, since a collegial relationship is established with individuals who are going to be the prime users of the system. Furthermore,by including a representative sample of a college's personnel in identifying problems and data needs, provides a more comprehensive assessment of factors that are preventing the organization functioning at an optimal level.

Since follow-up studies provide a college with important feedback regarding the effectiveness of the programmes and services it offers, investigations of this kind should be undertaken on a regular basis. Though follow-up studies are characterized by low response rates, it is possible, as shown in this investigation, through patience, planning,and perseverance to secure information from a large proportion of students after graduation. The investigator therefore recommends that college personnel assigned the responsibility of conducting follow-up studies give adequate consideration to the processes and procedures employed in this investigation.

The instruments used to gather data for this study need revising, to ensure that students with limited knowledge of the English language or minimal admission requirements are able quickly to comprehend and complete the items they contain. Consideration should also be given to shortening instruments and increasing the number of 'open-ended' items; however, modifications of this kind will depend upon the data needs of the college.

Since members of an organization tend to resist innovations that disturb the system, the investigator recommends that a redevelopment team be formed to plan, coordinate,and introduce the programme information system, insure its continuance and eventual internalization. In order to facilitate its acceptance members of this internal change agency should be representative of a college staff. This provides individuals, irrespective of their status,with a means of communicating their ideas, opinions,and evaluations of the system to the redevedopment team. This ensures that the needs of potential users are being given adequate consideration, increases the involvement of the staff in decision-making,and reduces resistance. All members of the redevelopment team should be awarded a honorarium for their services.

Initially administrators, faculty members and support staff could be familiarized with the processes of the system, anticipated benefits of better quality data,and function of the redevelopment team during in-service sessions, which would yield further feedback from users, increase awareness,and stimulate interest in the system. However, for the system to become operational on a permanent basis financial resources should be available for sponsoring staff to attend University,so they could acquire the knowledge and skills necessary for the system to become internalized into a college's administrative structure. Though analysis of data, writing reports and disseminating material could be completed during pilot-tests by graduate students from local universities, the staff of a college need to acquire adequate competence in these areas.

Application of the System

If Vancouver Vocational Institute is to maintain its effectiveness in developing human resources and sustain its credibility with the community it serves, the investigator recommends that the administrators and faculty examine the implications which the findings of this investigation have for the future development of the College. The programmes studied, for example, should be critically appraised to assess whether adequate attention is being devoted to assisting students develop critical thinking and creative problem solving abilities, which both the employers and faculty perceived as being of great importance in business, commerce and industry today. The evidence suggests that students need to be provided with more than the basic essentials of a trade, if they are are to cope effectively with the forces and pressures to which they will be exposed upon entering the labour market. If recent advances are to be discussed and more individualized instruction provided, programmes need to be widened in scope and extended in duration. By revising curricula and expanding programmes the investigator believes the goal discrepancies revealed by analysis would be considerably reduced.

The faculty in the Business Division should be encouraged to re-examine their curricula to assess whether the individual needs of students are being given adequate consideration, since the findings suggested the learning environment was deficient in this area. Furthermore, in all departments more emphasis should be devoted to better preparing students for job interviews, informing them of trade practices and advising them how to search for employment, because many young adults often are inadequately informed about the most effective procedures to employ for securing the position they desire after graduation.

Though graduates from the Service Division appeared satisfied with the vocational training they received, the low rank order assigned the following skills suggest they warrant further study: (1) 'mastery of technical skills'; and (2) 'developing relationships with colleagues and the public'. Insufficient time for students to comprehend the requirements of a trade and a tendency for programmes to be operated as business enterprises rather than learning centres could, to some extent, account for these assessments.

Since students are the recipients of the subject matter taught in class, an opportunity should be available for them to express their opinions, expectations, and criticisms of a programme. Often comments of these kind identify topics and areas of study that instructors have not perceived as being difficult. Students should be informed that suggestions they proposed are given adequate consideration in the development of new programmes, modification of curricula, and introduction of new instructional methods. A greater involvement of students in departmental affairs was evidently needed.

The responses of participants suggested that most of the programmes studied needed to be extended in length, which could only be accomplished with the consensus of Canada Manpower since most students were financially supported by this agency. Conferences should be arranged as early as possible for Canada Manpower officials, administrators, and faculty, to discuss and examine the possibility of extending the duration of programmes, so they better meet the needs of individuals and provide industry with a better trained labour force.

Both the student services and social activities available at Vancouver Vocational Institute need immediate improvement, since existing services are totally inadequate for the College's student population. Though most individuals attend college for less than ten months, creativity, imagination,and initiative on the part of the guidance staff could result in services being designed especially for a very transient student population. More vocational counselling needs to be offered since the findings suggested that a number of individuals were entering programmes unaware of course content, job opportunities and trade practices; consequently,they found the training provided did not satisfy their aspirations, which created unnecessary conflict between them and instructors. Library facilities need improving so students have an area where they can either read, prepare for class or complete assignments during their free-time.

A variety of social activities should be organized at Vancouver Vocational Institute, so as to provide students with an opportunity to associate with peers from other departments as well as faculty members in a relaxed and informal atmosphere. Such social events could establish the foundations for a college spirit; better relations between students and faculty; the removal of the impersonal atmosphere that students perceive characterize the College; and reduced isolation of departments.

Areas for Future Research

The conceptual framework utilized in the programme information system for generating data, provided a framework for conducting a wide range of studies that could vary extensively in scope. In this study resource, space, and time limitations required the application of the system to be delineated to examining rather superficially, five issues of concern to Vancouver Vocational Institute at a macro-level. The data gathered by the investigator while pilot-testing the programme information system, as illustrated, could have been employed to study a variety of issues at a divisional level of enquiry.

Using the system in its present form the following investigations could be conducted that would be of considerable value to a college:

1. To examine whether adults attending the various programmes offered by a college differ significantly with respect to their socio-economic characteristics, educational background, industrial experience, and occupational aspirations.
2. To study the extent to which students' motivational levels influence their achievements at college and performance in the labour market.
3. To investigate whether students' motivational levels, occupational aspirations and expectations are modified as a result of attending college.
4. To discover how faculty members utilize their time and identify the variety of duties they perform as part of their normal workload.
5. To investigate the influence that selected context, input, and process variables have on students' satisfaction with college, success in their studies, and accomplishments in industry.
6. To examine the possibility of developing a statistical

procedure for identifying potential dropouts, so they can be provided with guidance and counselling before they discontinue their studies.

7. To determine whether five years after graduation students are employed in occupations associated with the training they acquired at college.
8. To study the public relations a college has established with the community in which it is located.
9. To assess whether the availability of better quality data encourages administrators to employ a more rational approach to decision-making.
10. To determine the degree of congruence between the training provided by a college and the skills needed in various occupations.
11. To study how Canada Manpower's involvement in Vocational education affects the administrative procedures, staff morale, and programme offerings of a college.
12. To examine how the power relationships within a college influence administrative behaviour, programme development,and public relations.
13. To investigate how different leadership styles within the departments of a college affect decision-making, innovativeness, staff relationships,and organizational climate.
14. To examine how the communication systems of a college affect programme development, organizational change, decision-making, and goal attainment.

The findings derived from these investigations would expand the data file available to administrators and faculty members for making day-to-day decisions, developing curricula,and planning organizational change. At present, these activities are influenced, to a significant extent, by the personal bias of staff members, political dominance of certain community groups, administrative behaviour of senior administrators,and fluctuations in the economy. The programme information system, developed in this study, provides community college personnel with useful information for making judgments. By possessing better quality data these individuals should be able to resolve in a more rational manner problems having political, social, and economic consequences.

V IMPLICATIONS OF THE STUDY FOR EDUCATIONAL ADMINISTRATION

Research in the Field of Educational Administration

Many research studies completed in the field of educational administration are often only relevant to a specific educational institution and a particular period of time. These constraints naturally reduce the value of such investigations for future research, for practice in the field, and for the study of educational administration. This situation is the product of a number of factors, namely:

1. Limited resources for financing research projects;
2. Numerous difficulties encountered in conducting longitudinal, comprehensive, and comparative studies;
3. Various constraints associated with employing research methods, conceptual models, and statistical techniques from other field of enquiry to study educational issues.

The problem areas identified, however, characterize research studies undertaken in most areas of education due to the complex, intangible and dynamic nature of education.

The developmental approach employed in this investigation, in the opinion of the writer, offers educational researchers a new and more appropriate technique for studying various aspects of educational administration. One of the major benefits of this approach is that administration is viewed as an on-going, ever changing and vital process. In contrast to the scientific approach, which is often inappropriately employed to study many educational issues, a developmental research study investigates a situation as it exists in reality. Furthermore, researchers are provided with the means of assessing the consequence of specific causes of action, modifying conditions until a satisfactory level of performance is attained,and studying interrelationships among variables over a certain time period.

Though the developmental approach yields many benefits, there are numerous problems associated with its use which deter many graduate students, faculty members,and educational researchers from employing this dynamic research methodology. By using the developmental approach to establish a programme information system, this investigation has shown that such a methodology can be successfully and effectively employed to study issues of concern to educational administrators.

The components of the 'synthetic model' developed by Clarke, Konrad, Ottley and Ramer at the University of Alberta, provides a sound base for examining a variety of issues in the field of educational administration. A number of areas for future research have been identified which illustrate the wide range of research studies that can be undertaken employing this model. Furthermore,a systems approach, of this kind, enables the interrelationships between the major components of the educational process to be examined in detail. Feedback on the success of former students, in various occupational settings, provides administrators with useful information for evaluating, modifying,and developing programmes. At present very few community colleges undertake follow-up studies because of the low response rates, high expenditures,and additional manhours which characterize such investigations. The application of the programme information system, developed in this investigation, at Vancouver Vocational Institute, illustrates how the 'synthetic model' could be effectively employed to complete a follow-up study.

Practice of Educational Administration

The literature reviewed for this investigation revealed that administrators in most community colleges, as well as in many other educational institutions, often possess very limited information about their institutions. Decision-making in many instances, due to this situation, has become a process of 'muddling through' which has often resulted in unsatisfactory, inappropriate, and insufficient policies being adopted. The programme information system developed in this study provides administrators with a flexible, efficient, and inexpensive means of securing the information they need to perform their duties more effectively. Also better quality data enable them to counteract the influence of numerous political pressure groups.

By improving both the quantity and quality of information available on community college activities, the investigator believes that administrators would naturally employ a more rational approach in making judgments. If senior executives in post-secondary educational institutions, are to effectively cope with the demands and pressures of an industrial society they must employ, in the investigator's opinion, a more systematic approach to studying problems.

An important feature of the development process, used in this study, was the involvement of staff in all phases of the process which rarely occurs in many institutional settings. The failure of numerous innovations, in the past, according to the literature, was due to junior executives and technical personnel not being involved in the initial feasibility study or introduction of the innovation into the institution. If staff members are provided with the opportunity to comment, contribute and evaluate an innovation resistance to its introduction is considerably reduced. This programme information system offers staff ample opportunity to direct and shape its design so it better satisfies their information needs.

Study of Educational Administration

Presently our knowledge of educational administration is rather limited partially because it is not generally regarded as an academic discipline in most post-secondary institutions. According to Owens:

> Educational administration is, generally, taught within the framework of the school of education - sometimes comprising a department of the school, but often being less formally structured and known simply as the 'programme'.[10]

Furthermore,the concepts and models employed to study administrative behaviour in educational institutions have been borrowed from other disciplines. Though educational instructors have many characteristics in common with other organizations, by virtue of the functions they serve, their structure, operations,and goals also differ in many respects. Though educators may effectively utilize knowledge, concepts,and models from other disciplines to study the processes of educational administration, there is need for instruments, procedures,and conceptual frameworks to be developed for specifically studying this subject.

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[10] Robert G. Owens, Organizational Behaviour in Schools (Englewood Cliffs: Prentice-Hall, Inc., 1970), p. 2.

The 'systems model' employed in this study, as the data base for the programme information system, provides an excellent conceptual framework for studying a wide range of administrative problems in various kinds of educational institutions. Furthermore,the information generated by the system could function as a point of departure for establishing new theories about numerous administrative phenomena, activities,and practices. The information system, data base,and development process used in this study, in the investigator's opinion, have considerable potential for advancing our knowledge of educational administration.

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APPENDIX A

SAMPLE CHARACTERISTICS

Table 51

Distribution of Student Population Among the Occupational Divisions

	Student Population	
Division	N	%
Business	428	29
Service	284	20
Technical	739	51
Total*	1451	100

* October 1, 1974

Table 52

Distribution of Student Sample Selected from the Occupational Divisions

	Student Sample	
Division	N	%
Business	59	27
Service	91	42
Technical	67	31
Total	217	100

Table 53

Distribution of the Persistent Students and Dropouts in the Sample by Division and Programme

Division/ Programme	Persistent Students		Dropouts		Total	
	N	%	N	%	N	%
Business						
Commercial Basic	9	17	0	0	9	15
Medical Stenographer	9	17	0	0	9	15
Commercial Secretarial	13	25	4	57	17	29
Medical Assistant	21	41	3	43	24	41
Total	52	100	7	100	59	100
Service						
Beauty Culture	26	34	6	40	32	35
Waiter/Waitress	18	24	2	13	20	22
Short-Order Cook	22	28	1	7	23	25
Dental Technician	10	14	6	40	16	18
Total	76	100	15	100	91	100
Technical						
Architectural and Mechanical Drafting	15	28	4	28	19	29
Architectural and Structural Drafting	13	25	4	28	17	25
Electricity and Industrial Electronics	12	22	4	28	16	24
Electro-Mechanics	13	25	2	16	15	22
Total	53	100	14	100	67	100
Grand Total	181	100	36	100	217	100

Table 54

Response Rate of Graduates in Follow-Up Study

Division/ Programme	Mailed	Returned by Post Office	Delivered by Post Office	Returns				Response Rate			
								% of Mailed		% of Delivered	
				Used	Unusable	Late	Total				
	N	N	N	N	N	N	N	Total	Used	Total	Used
Business											
Commercial Basic	7	0	7	7	0	0	7	100	100	100	100
Medical Stenographer	9	0	9	5	0	0	5	56	56	56	56
Commercial Secretarial	13	0	13	5	0	3	8	62	39	62	39
Medical Assistant	21	0	21	11	1	1	13	62	52	62	52
Total	50	0	50	28	1	4	33	66	56	66	56
Service											
Beauty Culture	26	0	26	13	3	1	17	65	50	65	50
Waiter/Waitress	18	1	17	11	0	1	12	67	61	71	65
Short-Order Cook	22	0	22	18	0	0	18	82	82	82	82
Dental Technician	9	0	9	6	0	1	7	78	67	78	67
Total	75	1	74	48	3	3	54	72	64	73	65
Architectural and Mechanical Drafting	15	0	15	12	0	1	13	87	80	87	80
Architectural and Structural Drafting	13	0	13	9	0	1	10	77	69	77	69
Electricity and Industrial Electronics	12	0	12	9	0	1	10	83	75	83	75
Electro-Mechanics	13	0	13	8	1	1	10	77	62	77	62
Total	53	0	53	38	1	4	43	81	72	81	72
Grand Total	178	1	177	114	5	11	130	73	64	73	64

Table 55

Response Rate of Dropouts in Follow-Up Study

Division/ Programme	Mailed	Returned by Post Office	Delivered by Post Office	Returns				Response Rate			
				Used	Unusable	Late	Total	% of Mailed		% of Delivered	
	N	N	N	N	N	N	N	Total	Used	Total	Used
Business											
Commercial Basic	0	0	0	0	0	0	0	-	-	-	-
Medical Stenographer	0	0	0	0	0	0	0	-	-	-	-
Commercial Secretarial	4	0	4	2	0	0	2	50	50	50	50
Medical Assistant	2	1	1	0	0	1	1	50	0	100	0
Total	6	1	5	2	0	1	3	50	33	60	40
Service											
Beauty Culture	6	2	4	3	0	1	4	67	50	100	75
Waiter/Waitress	1	1	0	0	0	0	0	0	0	-	-
Short-Order Cook	1	0	1	0	0	0	0	0	0	0	0
Dental Technician	5	0	5	3	0	1	4	80	60	80	60
Total	13	3	10	6	0	2	8	62	46	80	60
Technical											
Architectural and Mechanical Drafting	4	0	4	4	0	0	4	100	100	100	100
Architectural and Structural Drafting	2	0	2	1	0	0	1	50	50	50	50
Electricity and Industrial Electronics	4	0	4	3	0	1	4	100	75	100	75
Electro-Mechanics	2	1	1	1	0	0	1	50	50	100	100
Total	12	2	10	9	0	1	10	83	83	100	100
Grand Total	31	6	25	17	0	4	21	68	55	84	68

Table 56

Response Rate of Employers in Follow-Up Study

Division/ Programme	Mailed	Returned by Post Office	Delivered by Post Office	Returns				Response Rate			
				Used	Unusable	Late	Total	% of Mailed		% of Delivered	
	N	N	N	N	N	N	N	Total	Used	Total	Used
Business											
Commercial Basic	5	5	5	4	0	0	4	80	80	80	80
Medical Stenographer	6	0	6	4	0	0	4	67	67	67	67
Commercial Secretarial	7	0	7	5	1	0	6	86	71	86	71
Medical Assistant	10	1	9	3	1	0	4	40	30	44	33
Total	28	1	27	16	2	0	18	64	57	67	59
Service											
Beauty Culture	15	0	15	7	0	2	9	60	47	60	47
Waiter/Waitress	9	0	9	3	0	1	4	44	33	44	33
Short-Order Cook	10	1	9	4	0	1	5	50	40	56	44
Dental Technician	8	0	8	6	0	1	7	88	75	88	75
Total	42	1	41	20	0	5	25	60	48	61	49
Technical											
Architectural and Mechanical Drafting	12	0	12	9	0	1	10	83	75	83	75
Architectural and Structural Drafting	8	0	8	4	1	1	6	75	50	75	50
Electricity and Industrial Electronics	3	0	3	1	0	1	2	67	33	67	33
Electro-Mechanics	6	0	6	4	0	0	4	67	67	67	67
Total	29	0	29	18	1	3	22	76	62	76	62
Grand Total	99	2	97	54	4	8	65	66	55	67	56

Table 57

Distribution of Persistent Students Who Completed Goals Inventory

Division/ Programme	Sample	Returns			Response Rate % of Sample	
		Used	Unusable	Total	Total	Used
	N	N	N			
Business						
Commerical Basic	10	9	1	10	100	90
Medical Stenographer	-	-	-	-	-	-
Commercial Secretarial	15	14	1	15	100	93
Medical Assistant	-	-	-	-	-	-
Total	25	23	2	25	100	92
Service						
Beauty Culture	28	25	3	28	100	89
Waiter/Waitress	-	-	-	-	-	-
Short-Order Cook	13	9	4	13	100	69
Dental Technician	14	13	1	14	100	93
Total	55	47	8	55	100	86
Technical						
Architectural and Mechanical Drafting	12	12	0	12	100	100
Architectural and Structural Drafting	-	-	-	-	-	-
Electricity and Industrial Electronics	14	13	1	14	100	93
Electro-Mechanics	17	16	1	17	100	94
Total	43	41	2	43	100	95
Grand Total	123	111	12	123	100	90

Table 58

Distribution of Employers Who Returned the Goals Inventory

Division/ Programme	Sample	Returns				Response Rate % of Sample	
		Used	Unusable	Late	Total	Total	Used
	N	N	N	N	N		
Business							
Commercial Basic	12	9	1	1	11	92	75
Medical Stenographer	7	5	2	0	7	100	71
Commercial Secretarial	9	7	1	0	8	89	78
Medical Assistant	10	2	3	1	6	60	20
Total	38	23	7	2	32	84	61
Service							
Beauty Culture	12	7	1	0	8	67	58
Waiter/Waitress	8	3	1	1	5	63	38
Short-Order Cook	8	1	0	3	4	50	13
Dental Technician	8	6	0	1	7	88	75
Total	36	17	2	5	24	67	47
Technical							
Architectural and Mechanical Drafting	6	4	1	0	5	83	67
Architectural and Structural Drafting	6	3	1	0	4	67	50
Electricity and Industrial Electronics	11	3	2	0	5	46	27
Electro-Mechanics	9	6	1	0	7	78	67
Total	32	16	5	0	21	66	50
Grand Total	106	56	14	7	77	73	53

Table 59

Distribution of Faculty-Members Who Completed Goals Inventory

Division	Sample	Returns			Response Rate % of Sample	
	N	Used	Unusable	Total	Total	Used
Business	10	9	1	10	100	90
Service	11	9	2	11	100	82
Technical	9	7	2	9	100	78
Total	32	25	5	32	100	78

APPENDIX B

BUDGET ESTIMATES

Table 60

Comprehensive Budget Estimates for Developing and Pilot-Testing the Programme Information System

Item	Expenditure	
Personnel		
Project Administrator	N/C	
Computer Programmer	$150	
Research Assistant	40	
Recording Clerk	50	
Secretary	700	
		$ 940
Communication, Supplies and Services		
Postage	$130	
Duplicating	145	
Telephone	60	
Stationary	40	
Technical Services		
Computer	250	
Keypunching	60	
Resource Material	50	
		$ 735
Travel and Subsistence		
Travel	$480	
Subsistence	950	
Miscellaneous	25	
		$1455
Final Report		
Printing (25 copies)	$260	
Binding (25 copies)	75	
		$ 335
Contingency	$ 50	
		$ 50
Total		$3515

Table 61

Maintenance Budget Estimates for the Programme Information System

Item	Expenditure	
Personnel (part-time/temporary)		
Project Administrators	$4000	
Resource Personnel	2000	
Research Assistants	120	
Recording Clerks	150	
Secretary	1500	
		$ 7,770
Communication, Supplies and Services		
Postage	$ 250	
Duplicating	300	
Telephone	50	
Stationary	80	
Technical Services		
Computer	150	
Keypunching	100	
Resource Material	75	
		$ 1,005
Professional Development		
In-Service	$ 300	
University Fees	750	
		$ 1,050
Reports	$ 250	
		$ 250
Total		$10,075*

* Follow-up study of 400-500 students and their employers.

APPENDIX C

INTERVIEW SCHEDULE

INTERVIEW SCHEDULE

DATA REPORT FORM

Interviewee.......................... Date..........................

Position............................. Dept..........................

PART I Basic Information Needs

PART II Adequacy of Existing Information System

PART III Feasibility of New Information System

PART IV Information Requirements

PART V General Comments

Interview Schedule

PART I Basic Information Needs

1.1 In what areas of college activity do you feel it is important to gather data?

1.2 Why did you select these areas?

1.3 What kind of data do you feel would be worthwhile to gather from the following people?

a. Students (in attendance, dropouts, former)
b. Employers
c. Administrators
d. Regional Office staff
e. Faculty members

1.4 What information do you think should be available on?

a. Instructional goals
b. Faculty workloads
c. Government policy
d. Organizational change
e. Physical plant
f. Future trends
g. Institutional policies and administrative procedures
h. Effectiveness of programmes and services
i. Expenditures and financial resources
j. Manpower and requirements of business, commerce and industry
k. Educational needs and expectations of clientele

PART II Adequacy of Existing Information System

2.1 What kind of data was available to you at the moment?

2.2 Are you satisfied with the information generating system of the College?

2.3 What changes in the existing system would you like to see introduced?

2.4 How satisfied are you with the following aspects of the present information system?

a. Data collection
b. Data storage
c. Retrieval of data
d. Reporting of data
e. Interpretation of data
f. Use of data

2.5 What information is presently available to you on?

a. Instructional goals
b. Faculty workloads
c. Government policy
d. Organizational change

e. Physical plant   f. Future trends
g. Institutional policies and administrative procedures
h. Effectiveness of programmes and services
i. Expenditures and financial resources
j. Manpower requirements of business, commerce and industry
k. Educational needs and expectations of clientele

2.6 Have you any suggestions as to how the existing system might be improved?

PART III Feasibility of New Information System

3.1 What do you consider to be the most important features of a new programme information system?

3.2 What constraints must be taken into consideration when developing a new information system?

a. Economic and financial
b. Technical
c. Staffing
d. Organizational and administrative
e. Resources
f. Other
g. Time

3.3 Do you consider it's feasibile to introduce a new information system in the college?

3.4 What impact do you **cons**ider such a system will have on a college ?

PART IV Information Requirements

4.1 What information do you perceive would be useful to the following members of the college staff?

a. Instructors
b. Department Heads
c. Divisional Chairmen
d. Senior Administrators
e. Regional Office Staff
f. Guidance Counsellors
g. Administrative Assistants

4.2 How would you like to see the data gathered processed and reported?

4.3 How should the information be disseminated after processing?

4.4 How would the following members of the College staff utilize better quality information?

a. Instructors
b. Department Heads
c. Divisional Chairmen
d. Senior Administrators
e. Regional Office Staff
f. Guidance Counsellors
g. Administrative Assistants

PART V General Comments

APPENDIX D

STUDENT QUESTIONNAIRES

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF EDUCATION
EDUCATIONAL PROGRAMMES
835 YATES STREET
VICTORIA, BRITISH COLUMBIA
V8W 2Z6

February 12, 1975

To Whom It May Concern:

I am aware of the study being undertaken by Mr. Peter James Murphy which is concerned with program evaluation for selected vocational programs.

The study addresses a matter, program evaluation, which is a topic of considerable concern to the Department of Education. I look forward to seeing the results of Mr. Murphy's study.

Yours truly,

J F Newberry

J. F. Newberry
Assistant Superintendent
Post-Secondary Programs

JFN:led

FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL
ADMINISTRATION

THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA
T6G 2E1

October 1974

Re: Community College Programme Evaluation Study

Dear Student:

The faculty and administration of the Vancouver City College are continually reviewing and modifying the various educational programmes the College offers, to ensure that young adults are provided with learning experiences that enable them to find employment of their choice, satisfy their personal needs and assist them cope with the demands of a dynamic technological society.

As part of my Ph.D. programme at the University of Alberta, I am developing a programme evaluation model, that will generate more detailed and accurate data for decision-making, policy formulation and long-run planning. The programme of studies in which you enrolled has been selected for evaluation and your co-operation in this venture will be greatly appreciated.

Attached to this letter you will find several questionnaires and tests for gathering data, which I will briefly explain how to complete. All students who participate in the study are guaranteed, that the information they provide will be analyzed in the strictest confidence and reported in a form that allows no individual participant to be identified. These conditions are designed to encourage students to express their personal opinions and exert a concentrated effort when completing the material they have been provided.

If this study is to be successful, your full co-operation is needed and I can assure you, that your willingness to participate in this research study is greatly appreciated.

Yours sincerely

Peter James Murphy

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

UNIVERSITY OF ALBERTA

Community College Programme Evaluation Study

Student Questionnaire I

In the spaces provided, please check the most appropriate answers to the following questions. All responses will be treated as confidential information. (Only check one response for each item.)

PART I Personal Data

			Computer Use Only
1. Identification number ______			C.C. 1,2,3,4,5,6 7,8
2. Sex	Female	1. ______	9
	Male	2. ______	
3. Marital Status	Married	1. ______	10
	Single	2. ______	
4. Age	Under 18	1. ______	11
	18-21	2. ______	
	22-30	3. ______	
	31-40	4. ______	
	41-50	5. ______	
	51 or older	6. ______	
5. How frequently have you changed your residence in the past 5 years?	Never	1. ______	12
	Once	2. ______	
	Twice	3. ______	
	Three occasions	4. ______	
	Four occasions or more	5. ______	
6. What is your major source of financial aid?	Canada Manpower	1. ______	13
	Student Loan	2. ______	
	Family	3. ______	
	Indian Affairs	4. ______	
	Social Welfare	5. ______	
	Personal Savings	6. ______	
	Part-time jobs	7. ______	
	Fellowship	8. ______	
	Other	9. ______	

			Computer Use Only C.C.
7. What is your major purpose for attending college?	Improve chances of employment	1. ______	14
	Promotion	2. ______	
	Learn a new trade or occupation	3. ______	
	Upgrading (education/trade)	4. ______	
	Gain employment outside home community	5. ______	
	Gain entrance to advanced programmes	6. ______	
	Personal interest	7. ______	
	Other	8. ______	
8. Which of the following individuals influenced you the most to attend College? (Check one only)	Parent	1. ______	15
	Others in your family or relatives	2. ______	
	Friend	3. ______	
	High school teacher	4. ______	
	High school counsellor	5. ______	
	Other counsellor (Canada Manpower, Y.M.C.A., Social Worker etc.)	6. ______	
	Self initiated	7. ______	
	Employer	8. ______	
	Other	9. ______	
9. What is your gross family income (income before deductions) per week while attending College? Married. Students include the income of all members of the family who are working. A single student should only state his/her own income.	Under $50	1. ______	16
	$ 50-$ 99	2. ______	
	$100-$149	3. ______	
	$150-$199	4. ______	
	$200-$249	5. ______	
	$250-$299	6. ______	
	$300-$349	7. ______	
	$350-$399	8. ______	
	$400 or more	9. ______	
10. What is the total number of people in your family?	One	1. ______	17
	Two	2. ______	
	Three	3. ______	
	Four	4. ______	
	Five	5. ______	
	Six	6. ______	
	More than six	7. ______	

Computer
Use Only
C.C.

11. What are your total expenses per week while attending college? (Include fees, room and board, cost of texts, transport, personal expenses etc.)

			C.C.
Under $50	1.	______	18
$ 50-$ 99	2.	______	
$100-$149	3.	______	
$150-$199	4.	______	
$200-$249	5.	______	
$250-$299	6.	______	
$300-$349	7.	______	
$350-$399	8.	______	
$400 or more	9.	______	

12. How many books per month do you read (excluding College texts)?

			C.C.
One	1.	______	19
Two	2.	______	
Three	3.	______	
Four	4.	______	
Five	5.	______	
Six or more	6.	______	
More than six	7.	______	

PART II Family Background

13. Which of the following categories best describes the occupation of your parents?

	Male parent		Female parent		C.C.
Clerical	01.	______	01.	______	20,21 22,23
Deceased	02.	______	02.	______	
Farmer	03.	______	03.	______	
Managerial	04.	______	04.	______	
Miner	05.	______	05.	______	
Professional	06.	______	06.	______	
Retired	07.	______	07.	______	
Sales	08.	______	08.	______	
Semi-skilled	09.	______	09.	______	
Service	10.	______	10.	______	
Skilled worker	11.	______	11.	______	
Technical	12.	______	12.	______	
Transport	13.	______	13.	______	
Unskilled	14.	______	14.	______	
Homemaker	15.	______	15.	______	
Unemployed	16.	______	16.	______	
Other	17.	______	17.	______	

				Computer Use Only C.C.
14. What was the highest level of education completed by your parents?		Male parent	Female parent	
	Elementary School (grade VI-VII	01. ____	01. ____	
	Junior High School (grade VIII-IX)	02. ____	02. ____	
	Part High School (grade X-XI)	03. ____	03. ____	
	High School graduate (grade XII)	04. ____	04. ____	
	Trade or vocational training	05. ____	05. ____	
	Technical training or some University	06. ____	06. ____	24,25 26,27
	Completed Bachelor's degree	07. ____	07. ____	
	Completed Professional degree	08. ____	08. ____	
	Completed Post-graduate degree	09. ____	09. ____	
	Did not attend school	10. ____	10. ____	
	Do not know	II. ____	II. ____	

15. What is your parents' gross annual income (income before deductions)?	Under $5,000	1. ____	28
	$ 5,000-$ 9,999	2. ____	
	$10,000-$14,999	3. ____	
	$15,000-$19,999	4. ____	
	$20,000-$24,999	5. ____	
	$25,000-$29,999	6. ____	
	$30,000 and over	7. ____	
	Do not know	8. ____	
	Not applicable	9. ____	
16. How frequently have your parents changed their residence in the past 5 years?	Never	1. ____	29
	Once	2. ____	
	Twice	3. ____	
	Three occasions	4. ____	
	More than three occasions	5. ____	
	Not applicable	6. ____	
17. To what extent were you encouraged to attend college by your parents?	Not at all	1. ____	30
	Very little	2. ____	
	Some	3. ____	
	Very much	4. ____	
18. How many children were in your parent's family (brothers, sisters plus yourself)?	One	1. ____	31
	Two	2. ____	
	Three	3. ____	
	Four	4. ____	
	Five	5. ____	
	Six	6. ____	
	Seven or more	7. ____	

			Computer Use Only C.C.
19. What level of education would your parents like you to attain?	Part high school (grades X-XI)	1. ______	32
	High school graduate (grade XII)	2. ______	
	Trade or vocational training	3. ______	
	Technical training or some University	4. ______	
	Bachelor's degree	5. ______	
	Professional degree	6. ______	
	Post-graduate degree	7. ______	
	Do not know	8. ______	
20. Which of the following categories best describes the occupation your parents would like you to secure?	Clerical	01. ______	33,34
	Farmer	02. ______	
	Managerial	03. ______	
	Miner	04. ______	
	Professional	05. ______	
	Sales	06. ______	
	Semi-skilled	07. ______	
	Service	08. ______	
	Skilled worker	09. ______	
	Technical	10. ______	
	Transport	11. ______	
	Unskilled	12. ______	
	Homemaker	13. ______	
	Unemployed	14. ______	
	Other	15. ______	

PART III Academic Background

21. What was the last grade you completed at school?	Grade 7 or less	1. ______	35
	Grade 8	2. ______	
	Grade 9	3. ______	
	Grade 10	4. ______	
	Grade 11	5. ______	
	Grade 12	6. ______	
	Grade 13	7. ______	
22. How long is it since you left a public school or equivalent institution?	Less than 1 year	1. ______	36
	1 year	2. ______	
	2 years	3. ______	
	3 years	4. ______	
	4 years	5. ______	
	5 years or more	6. ______	

Computer Use Only
C.C.

23. When you attended a public school in which of the following programmes were you enrolled?

Academic-Technical 1. ______
Commercial 2. ______
Industrial 3. ______
Community Services 4. ______
Visual and Performing Arts 5. ______
General 6. ______
Special Education 7. ______
Other 8. ______

37

24. What was the approximate mark you attained in your last full year in a public school?

A = 86-100 1. ______
B = 73- 85 2. ______
C+ = 67- 72 3. ______
C = 60- 66 4. ______
P (or D) = 50-59 5. ______
Fail = 0-49 6. ______

38

25. How would you assess your performance in a public school?

Exceptional 1. ______
Superior 2. ______
Very good 3. ______
Above average 4. ______
Average 5. ______
Below average 6. ______
Poor 7. ______
Very poor 8. ______

39

PART IV Expectations

26. What is the highest level of education you expect to attain during your life-time?

Partial high school 1. ______
High school graduate 2. ______
Trade or vocational training 3. ______
Technical training or some University 4. ______
Bachelor's degree 5. ______
Professional degree 6. ______
Post-graduate degree 7. ______
Do not know 8. ______

40

27. Which of the following categories best describes the occupation you want to secure upon leaving college?

Clerical 01. ______
Farmer 02. ______
Managerial 03. ______
Miner 04. ______
Professional 05. ______
Sales 06. ______
Semi-skilled 07. ______
Service 08. ______
Skilled worker 09. ______
Technical 10. ______
Transport 11. ______
Unskilled 12. ______
Homemaker 13. ______
Unemployed 14. ______
Other 15. ______

41,42

				Computer Use Only C.C.
28.	What overall mark do you expect to attain in your programme of studies at college?	A = 86-100	1. ______	43
		B = 73- 85	2. ______	
		C+ = 67- 72	3. ______	
		C = 60- 66	4. ______	
		P (or D) = 50- 59	5. ______	
		Fail = 0- 49	6. ______	
29.	How many hours per week outside class do you expect you will have to devote to your studies?	Less than 1 hour	1. ______	44
		1- 3 hours	2. ______	
		4- 6 hours	3. ______	
		7- 9 hours	4. ______	
		10-12 hours	5. ______	
		13 or more hours	6. ______	
30.	In which of the following activities would you expect to find your greatest life satisfaction?	Career, occupational or vocational activities	01. ______	45,46
		Professional or intellectual activities	02. ______	
		Making money, business interests	03. ______	
		Marriage and family	04. ______	
		Leisure time activities	05. ______	
		Religious beliefs and activities	06. ______	
		Improving life for others	07. ______	
		Literature, art, music	08. ______	
		Community activities	09. ______	
		Not listed	10. ______	
31.	How do you expect to perform at college?	Exceptional	1. ______	47
		Superior	2. ______	
		Very good	3. ______	
		Above average	4. ______	
		Average	5. ______	
		Below average	6. ______	
		Poor	7. ______	
		Very poor	8. ______	
32.	What salary per week (gross - before deductions) do you expect to earn after you leave college?	Under $50	1. ______	48
		$ 50-$ 99	2. ______	
		$100-$149	3. ______	
		$150-$199	4. ______	
		$200-$249	5. ______	
		$250-$299	6. ______	
		$300-$349	7. ______	
		$350-$399	8. ______	
		$400 or more	9. ______	

PART V Study Habits

To what extent

	Never	Very Little	Some	Considerably	Very Much	Computer Use Only C.C.
	1	2	3	4	5	
33. (i) are you easily distracted from your studies:						49
34. (ii) do you visit the library?						50
35. (iii) do you experience trouble in outlining or note taking?						51
	1	2	3	4	5	
36. (iv) do you have trouble completing assignments?						52
37. (v) do you give outside interests and activities priority over your studies?						53
38. (vii) do you prepare before going to class?						54
	1	2	3	4	5	

PART VI Previous Employment

39. What was your gross income per week before entering college ?

Under $50 1. ______
$ 50-$ 99 2. ______
$100-$149 3. ______
$150-$199 4. ______
$200-$249 5. ______
$250-$299 6. ______ 55
$300-$349 7. ______
$350-$399 8. ______
$400 or more 9. ______

40. Which of the following best describes your most recent occupation ?

			Computer Use Only
Clerical	01.	______	
Farmer	02.	______	
Managerial	03.	______	
Miner	04.	______	
Professional	05.	______	
Sales	06.	______	
Semi-skilled	07.	______	
Service	08.	______	56,57
Skilled worker	09.	______	
Technical	10.	______	
Transport	11.	______	
Unskilled	12.	______	
Homemaker	13.	______	
Unemployed	14.	______	

Please check to see you have answered all the questions. This is most important.

Thank you very much for your cooperation and assistance.

Peter James Murphy

STUDENT INFORMATION CARD

Please Print All
Information Clearly

1 Identification Number ____________________

2 Surname ____________________

3 Other Names ____________________

____

4 Present Address ____________________

____

____

5 Telephone Number ____________________

6 Code Number ____________________

7 Resident ____________________

____

8 Permanent Address ____________________

____

____

9 Telephone Number ____________________

10 Employer ____________________

____

11 Address ____________________

____

____

12 Telephone Number ____________________

13* Student Status ____________________

____

14* Grade Point Average ____________________

15* Length of Programme ____________________

____

16 Immediate Supervisor ____________________

____

17 Address ____________________

____

____

18 Telephone Number ____________________

* Do Not Answer

FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL
ADMINISTRATION

THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA
T6G 2E1

January 1975

Re: Community College Programme Evaluation Study

Dear Student:

Soon after you enrolled in your programme of studies, I visited one of your classes to secure your co-operation and participation in a research study, I was conducting to develop a programme evaluation model, for assessing the effectiveness of various programmes offered by the Vancouver City College. On that occasion you completed several questionnaires and tests, the data from which enabled me to establish a fairly accurate profile of the average young adult who enrolled in the same programme of studies as yourself.

In the very near future you will be sitting your final examination and graduating from college, after which you will be commencing the career of your choice. Before leaving college, I would very much appreciate you completing the questionnaires and tests attached to this letter. The purpose of these instruments is to assess, if possible, the impact attendance at college has had on various students.

When completing these questionnaires your honest judgement and uttermost concentration is desired, since the value of the data gathered depends upon the effort you exert and willingness to express your personal opinion. All responses, as in the initial survey, will be analyzed in the strictest confidence and results reported in a form that prevents any individual from being identified.

The co-operation and assistance you have provided by your participation in this study, has been greatly appreciated by the faculty and administration of the college as well as myself. The data that has been gathered will undoubtedly provide valuable information for improving programmes that are offered in the future.

Yours sincerely

Peter James Murphy

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

UNIVERSITY OF ALBERTA

Community College Programme Evaluation Study

Student Questionnaire II

In the spaces provided, please check the most appropriate answers to the following questions. All responses will be treated as confidential information. (Only check one response for each item.)

Computer Use Only C.C.

Surname: ____________________

First name: ________________ Identification No. ______________

Telephone No. ________________

1,2,3,4,5,6,7,8

PART I Expectations

				C.C.
1. What is the highest level of education you expect to attain during your life-time?	Part high school (grades X-XI)	1.	____	9
	High school graduate (grade XII)	2.	____	
	Trade or vocational training	3.	____	
	Technical training or some University	4.	____	
	Bachelor's degree	5.	____	
	Professional degree	6.	____	
	Post-graduate degree	7.	____	
	Do not know	8.	____	
2. What overall grade do you expect to attain in your programme of studies at college?	A = 86-100	1.	____	10
	B = 73- 85	2.	____	
	C+ = 67- 72	3.	____	
	C = 60- 66	4.	____	
	P (or D) = 50-59	5.	____	
	Fail = 0-49	6.	____	
3. How would you rate your performance at college?	Exceptional	1.	____	11
	Superior	2.	____	
	Very good	3.	____	
	Above average	4.	____	
	Average	5.	____	
	Below average	6.	____	
	Poor	7.	____	
	Very poor	8.	____	

				Computer Use Only C.C.
4. Which of the following categories best describes the occupation you want to secure upon leaving college?	Clerical	01.	______	12,13
	Farmer	02.	______	
	Managerial	03.	______	
	Miner	04.	______	
	Professional	05.	______	
	Sales	06.	______	
	Semi-skilled	07.	______	
	Service	08.	______	
	Skilled worker	09.	______	
	Technical	10.	______	
	Transport	11.	______	
	Unskilled	12.	______	
	Homemaker	13.	______	
	Unemployed	14.	______	
	Other	15.	______	
5. What level of performance do you expect to achieve in position you secure after leaving college?	Exceptional	1.	______	14
	Superior	2.	______	
	Very good	3.	______	
	Above average	4.	______	
	Average	5.	______	
	Below average	6.	______	
	Poor	7.	______	
	Very poor	8.	______	
6. What salary per week (gross - before deductions) do you expect to earn after you leave college?	Under $50	1.	______	15
	$ 50-$ 99	2.	______	
	$100-$149	3.	______	
	$150-$199	4.	______	
	$200-$249	5.	______	
	$250-$299	6.	______	
	$300-$349	7.	______	
	$350-$399	8.	______	
	$400 or more	9.	______	
7. In which of the following activities would you expect to find your greatest life satisfaction?	Career, occupational or vocational activities	01.	______	16,17
	Professional or intellectual activities	02.	______	
	Making money, business interests	03.	______	
	Marriage and family	04.	______	
	Leisure time activities	05.	______	
	Religious beliefs and activities	06.	______	
	Improving life for others	07.	______	
	Literature, art, music	08.	______	
	Community activities	09.	______	
	Not listed	10.	______	

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C.C.

8. What kind of job do you hope to secure after graduating from college?. ________ 18,19

PART II Satisfaction with College

9. Have you been provided in your programme of studies with details of the duties you will be expected to perform in your future job?.

Very much 4. ______
Some 3. ______
Very little 2. ______
Not at all 1. ______

20

10. To what extent has the training you received at college been consistent with your perceptions of the tasks you will be assigned when employed full-time?.

Very much 4. ______
Some 3. ______
Very little 2. ______
Not at all 1. ______

21

What is your appraisal of the following aspects of the programme in which you are enrolled?.

	Poor	Below Average	Average	Very Good	Excellent	
	1	2	3	4	5	
11. Quality of instruction						22
12. Instructors' interest in students						23
13. Preparation for job interview						24
14. Assistance in overcoming learning difficulties						25
15. Assistance to resolve personal problems						26
	1	2	3	4	5	

	Poor	Below Average	Satisfactory	Very Good	Superior	Computer Use Only C.C.
	1	2	3	4	5	
16. Assistance in finding a job						27
17. Achieving your educational and vocational goals						28

How well do you consider your programme of studies has prepared you for the following job requirements?.

	1	2	3	4	5	
18. Mastery of technical skills						29
19. Developing relationships with colleagues and public						30
20. Personal appearance and conduct						31
21. Readiness to accept responsibility						32
	1	2	3	4	5	
22. High level of dependability						33
23. Ability to accept and follow instructions						34
24. Express creativeness						35
25. Exhibit initiative						36
	1	2	3	4	5	

	Poor	Below Average	Satisfactory	Very Good	Superior	Computer Use Only C.C.
	1	2	3	4	5	
26. Being in regular attendance						37
	1	2	3	4	5	

PART III Income and Expenditures

27. What was your gross salary per week before entering college?. ____________ 38,39

28. What amount of income tax was deducted form your salary each week?. ____________ 40,41

29. What financial aid do you receive from a government agency per week?. (Canada Manpower, Indian Affairs, Social Welfare, Provincial Government (student loan) etc.) ____________ 42,43

30. Do you have a part-time job while attending college?. ____________ 44

31. What salery per week are you paid for this part-time job?. ____________ 45,46

32. What income tax is deducted each week from your part-time earnings?. ____________ 47,48

33. What tuition fees did you pay to attend college?. ____________ 49,50

			Comouter Use Only C.C.
34.	What additional expenses have you had to pay related to your programme of studies?.(tools, uniform, paper, pens, student union fees etc.)	________	51,52
35.	What are your personal expenses per week while attending college?. (transport, laundry, room and board, health insurance, enterainment, incidental purchases etc.)	________	53,54
36	What is your gross family income (before deductions) per week while attending college?. (Married students include the income of all members of your family living at home. Single students should only state their own income)	________	55,56
37	What is the total number of people in your family?. (Married students include wife, children and relatives who reside in your home. Single students should consider themselves a one member family unit)	________	57,58
38	What is the total income tax paid by the members of your family per week?.	________	59,60

Please check to see you have answered all the questions. This is most important.

Thank you very much for your cooperation and assistance.

Peter James Murphy

FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL
ADMINISTRATION

THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA
T6G 2E1

March 1975

Re: Community College Programme Evaluation Study

Dear Alumni:

Recently you completed a programme of studies at Vancouver City College, designed to equip you find productive employment in the labour market. Several times during your programme I visited one of the classes you attended, to outline a research study I am undertaking as part of my Ph.D. programme at the University of Alberta, seeking your co-operation and assistance in providing data for developing a programme information system, to assist community college provide better programmes and services for students.

Since the last meeting, you have graduated from College and are now in a position to reflect on the educational experiences to which you were exposed, as to their usefulness in your field of employment. If you are presently seeking employment your opinion would still be welcomed.

I am aware that presently you have little spare time at your disposal, consequently the enclosed questionnaires have been designed so they require no more than 20 minutes to complete. Any statements you have to write should be limited to ten words or less. A stamped addressed envelope has been provided for returning the questionnaire, which I would appreciate you undertaking as soon as possible.

All responses, as in previous questionnaires, will be analyzed in the strictest confidence and reported in a form that no individual can be identified. Your participation in this study, from its beginning to its conclusion, has been greatly appreciated and the information you so willingly provided has made a valuable contribution towards its success.

Yours respectfully,

Peter James Murphy

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

UNIVERSITY OF ALBERTA

Community College Programme Evaluation Study

Student Questionnaire III

In the spaces provided, please check the most appropriate answers to the following questions. All responses will be treated as confidential information. (Only check one response for each item, unless otherwise stated.)

Surname: ____________________

First name: ____________________ Identification No. ____________________

Telephone No. ____________________

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1,2,3,4,5,6, 7,8

PART 1 Employer

1. Write the name and address of your present employer and indicate the subdivision of the company if it's appropriate. If you work for a government agency report the department, bureau, division or sector, whichever applies.

Employer ____

Address ____

____________________________________ Telephone No. __________

Subdivision ____

Address ____

____________________________________ Telephone No. __________

2. Write the name and job title of your immediate supervisor.

Supervisor's Name ____

Supervisor's Job

Title ____

____________________________________ Telephone No. __________

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C.C.

3. Write the job title of your position, present address and telephone number.

Job Title ____________________

Address (Home) ____________________

____

____

PART II Present Employment,

				C.C.
4. How soon after leaving college were you employed?	Less than 1week	1.	______	9
	1 week	2.	______	
	2 weeks	3.	______	
	3 weeks	4.	______	
	4 weeks	5.	______	
	More than 4 weeks (specify) ______	6.	______	
5. Who helped you most in getting your present job? (check more than one if necessary)	Parent/relative	1.	______	10-18
	Friends	2.	______	
	Own efforts	3.	______	
	College faculty member	4.	______	
	Manpower representative	5.	______	
	Newspaper	6.	______	
	Private employment agency	7.	______	
	Public agency (other than Manpower)	8.	______	
	Other (specify) ______	9.	______	
6. What influenced you to accept your first position after leaving college? (check more than one if necessary)	Desired location	1.	______	19-25
	Salary offered	2.	______	
	Liked person by whom I was interviewed	3.	______	
	Offered type of employment I was seeking	4.	______	
	Friends were already working there	5.	______	
	Only one offered	6.	______	
	Other (specify) ______	7.	______	

			Computer Use Only C.C.
7. What are you doing at present?	Working full-time	1. ______	26
	Working part-time	2. ______	
	Attending College/ University full-time	3. ______	
	Attending College/ University part-time	4. ______	
	Homemaker	5. ______	
	Operating own business	6. ______	
	Member of the armed forces	7. ______	
	Unemployed	8. ______	
	Other (specify)	9. ______	
	______		
8. Which of the following categories best describes your present employment?	Clerical	1. ______	27,28
	Farmer	2. ______	
	Managerial	3. ______	
	Miner	4. ______	
	Professional	5. ______	
	Sales	6. ______	
	Semi-skilled	7. ______	
	Service	8. ______	
	Skilled worker	9. ______	
	Technical	10. ______	
	Transport	11. ______	
	Unskilled	12. ______	
	Homemaker	13. ______	
	Unemployed	14. ______	
	Other	15. ______	
9. What salary per week (gross - before deductions) are you presently receiving?	Under $50	1. ______	29
	$ 50-$ 99	2. ______	
	$100-$149	3. ______	
	$150-$199	4. ______	
	$200-$249	5. ______	
	$250-$299	6. ______	
	$300-$349	7. ______	
	$350-$399	8. ______	
	$400-or more	9. ______	
10. What amount of income tax is deducted from your salary each week?	Under $20	1. ______	30
	$ 20-$ 39	2. ______	
	$ 40-$ 59	3. ______	
	$ 60-$ 79	4. ______	
	$ 80-$ 99	5. ______	
	$100-$119	6. ______	
	$120-$139	7. ______	
	$140-$159	8. ______	
	$160 or more	9. ______	

				Computer Use Only C.C.
11.	How would you rate your performance in your present occupation?	Exceptional	1. ______	31
		Superior	2. ______	
		Very good	3. ______	
		Above average	4. ______	
		Average	5. ______	
		Below average	6. ______	
		Poor	7. ______	
		Very poor	8. ______	
12.	Are you satisfied with your present position?	Very satisfied	1. ______	32
		Reasonably satisfied	2. ______	
		No opinion	3. ______	
		Somewhat dissatisfied	4. ______	
		Very dissatisfied	5. ______	
13.	Was the position you secured after leaving College related to the education and training you had received there?	Very much	1. ______	33
		Considerably	2. ______	
		Some	3. ______	
		Very little	4. ______	
		None	5. ______	
14.	In what type of job are you presently employed? (state job title)		______	34
15.	What do you expect your gross earnings to be during the first year after leaving college?	Less than $2000	1. ______	35,36
		$2000 $3999	2. ______	
		$4000 $5999	3. ______	
		$6000 $7999	4. ______	
		$8000 $9999	5. ______	
		$10000 $11999	6. ______	
		$12000 $13999	7. ______	
		$14000 $15999	8. ______	
		$16000 $17999	9. ______	
		$18000 $19999	10. ______	
		$20000 $219999	11. ______	
		$22000 $239999	12. ______	
		$24000 and over	13. ______	

16. What do you expect your 'take home' wages per month to be during the first year after leaving college?

			Computer Use Only
Less than $200		1. ______	
$200	$399	2. ______	
$400	$599	3. ______	
$600	$799	4. ______	
$800	$999	5. ______	
$1000	$1199	6. ______	
$1200	$1399	7. ______	37,38
$1400	$1599	8. ______	
$1600	$1799	9. ______	
$1800	$1999	10. ______	
$2000	$2199	11. ______	
$2200	$2399	12. ______	
$2400 and over		13. ______	

PART II Satisfaction with College

What is your appraisal of the following aspects of the programme in which you were enrolled

		Poor	Below Average	Average	Very Good	Excellent	
		1	2	3	4	5	
17.	Quality of instruction						39
18.	Instructors' interest in students						41
19.	Preparation for job interview						42
20.	Assistance in overcoming learning difficulties						43
21.	Assistance to resolve personal problems						44
		1	2	3	4	5	
22.	Assistance in finding a job						45
23.	Achieving your educational and vocational goals						46

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C.C

How well did your programme of studies prepare you for the following job requirements?

	Poor	Below Average	Satisfactory	Very Good	Superior	
	1	2	3	4	5	
24. Mastery of technical skills						47
25. Developing relationships with colleagues and public						48
26. Personal appearance and conduct.						49
27. Readiness to accept responsibility						50
	1	2	3	4	5	
28. High level of dependability						51
29. Ability to accept and follow instructions						52
30. Express creativeness						53
31. Exhibit initiative						54
32. Being in regular attendance.						55
	1	2	3	4	5	

33. To what extent was the training you received at college consistent with the tasks you have been assigned in you present job?

Very much 4. ______
Some 3. ______
Very little 2. ______
Not at all 1. ______

56

PART V Instructors

While attending college you were taught by several instructors, using the scale provided circle the most appropriate response for the given statements

	None of my instructors	A minority of my instructors	About half of my instructors	A majority of my instructors	All of my instructors	Computer Use Only
34. Instructors present material in an entertaining (e.g., dramatic, humorous) manner.	1	2	3	4	5	57
35. Instructors give personal opinions or describe personal experiences.	1	2	3	4	5	58
36. Instructors seem to be "out of touch" with student life.	5	4	3	2	1	59
37. Lectures are dry, dull, and monotonous.	5	4	3	2	1	60
38. Faculty members have an unusual facility for communicating their knowledge to students.	1	2	3	4	5	61
39. Instructors appear to be uneasy and nervous.	5	4	3	2	1	62
40. Instructors criticize or embarrass students in the classroom.	5	4	3	2	1	63
41. Instructors relate course material to contemporary problems.	1	2	3	4	5	64
42. Insufficient distinction is made between major ideas and less important details.	5	4	3	2	1	65
43. Instructors don't seem to care whether or not class material is understood.	5	4	3	2	1	66
44. Students are given an important voice in determining class objectives and procedures.	1	2	3	4	5	67
45. Out-of-class assignments (reading, papers, etc.) are reasonable in length.	1	2	3	4	5	68
46. Instructors give students ample opportunity to participate in discussion, to ask questions, and to express points of view.	1	2	3	4	5	69
47. Instructors give disorganized, superficial, or imprecise treatment to their material.	5	4	3	2	1	70

Computer Use Only C.C

PART VI Recommendations for Improvement

What recommendations would you propose for improving

48. a) the programmes offered by the college

71,72

b) the student services offered by the college. (guidance, housing, recreation, dining etc.)

73,74

c) the social activities at the college

75,76

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C.C

d) the general organization of the college

77,78

49. Please feel free to comment on any issues related to college education that are of concern to you, that have not been mentioned in this questionnaire

79,80

Please check to see you have answered all the questions. This is most important.

Thank you very much for your cooperation and assistance.

Peter James Murphy

FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL
ADMINISTRATION

THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA
T6G 2E1

March 1975

Re: Community College Programme Evaluation Study

Dear Former Student:

Recently you enrolled in one of the programmes offered by Vancouver City College, in order to obtain specialized training that would enable you to secure employment in a career of your choice. During the first month at college, I visited your class to outline a study I was conducting as part of my Ph.D. programme at the University of Alberta and secure your involvement in the project.

It was brought to my attention, by the registrar's office, that you have discontinued your studies and are no longer a full-time student, however your continued involvement in the study would be appreciated, especially since the faculty and administration have minimal knowledge as to why some students withdraw before completing their studies.

The questionnaires attached to this letter have been designed so that they require no more than 20 minutes to complete, which I would appreciate you undertaking at your earliest convenience.

As I emphasized at our initial meeting, all data provided by participants is analyzed in the strictest confidence and will be reported in such form that no single individual can be identified.

Though your time is probably in great demand, you have my assurance that the time and effort you devote to completing this questionnaire will be worthwhile, since the results of the study will assist the faculty and administration develop programmes that better satisfy the needs, aspirations and expectations of the young adults the college serves.

Yours sincerely,

Peter James Murphy

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

UNIVERSITY OF ALBERTA

Community College Programme Evaluation Study

Student Questionnaire IV

In the spaces provided, please check the most appropriate answer to the following questions. All responses will be treated as confidential information. (Only check one response for each item, unless otherwise stated.)

Surname: ______________

First name: ______________ Identification No. ______________

Telephone No. ______________

Computer
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C.C.

1,2,3,4,5,6,
7,8

PART I Employer

1. Write the name and address of your present employer and indicate the subdivision of the company if it's appropriate. If you work for a government agency report the department, bureau, division or sector, whichever applies.

Employer ______________________________

Address ______________________________

______________________ Telephone No. ________

Subdivision ______________________________

Address ______________________________

______________________ Telephone No. ________

2. Write the name and job title of your immediate supervisor.

Supervisor's Name ______________________________

Supervisor's Job

Title ______________________________

______________________ Telephone No. ________

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C.C.

3. Write the job title of your position, present address and telephone number.

Job Title ______________________________

Address (Home) ______________________________

____

____

PART II Present Employment

			Computer Use Only C.C.
4. How soon after leaving college were you employed?	Less than 1week	1. ____	9
	1 week	2. ____	
	2 weeks	3. ____	
	3 weeks	4. ____	
	4 weeks	5. ____	
	More than 4 weeks (specify) ____________	6. ____	
5. Who helped you most in getting your present job? (check more than one if necessary)	Parent/relative	1. ____	10-18
	Friends	2. ____	
	Own efforts	3. ____	
	College faculty member	4. ____	
	Manpower representative	5. ____	
	Newspaper	6. ____	
	Private employment agency	7. ____	
	Public agency (other than Manpower)	8. ____	
	Other (specify) ____________	9. ____	
6. What influenced you to accept your first position after leaving college? (check more than one if necessary)	Desired location	1. ____	19-25
	Salary offered	2. ____	
	Liked person by whom I was interviewed	3. ____	
	Offered type of employment I was seeking	4. ____	
	Friends were already working there	5. ____	
	Only one offered	6. ____	
	Other (specify) ____________	7. ____	

			Computer Use Only
7. What are you doing at present?	Working full-time	1. ______	26
	Working part-time	2. ______	
	Attending College/ University full-time	3. ______	
	Attending College/ University part-time	4. ______	
	Homemaker	5. ______	
	Operating own business	6. ______	
	Member of the armed forces	7. ______	
	Unemployed	8. ______	
	Other (specify)	9. ______	
	______________		
8. Which of the following categories best describes your present employment?	Clerical	1. ______	27,28
	Farmer	2. ______	
	Managerial	3. ______	
	Miner	4. ______	
	Professional	5. ______	
	Sales	6. ______	
	Semi-skilled	7. ______	
	Service	8. ______	
	Skilled worker	9. ______	
	Technical	10. ______	
	Transport	11. ______	
	Unskilled	12. ______	
	Homemaker	13. ______	
	Unemployed	14. ______	
	Other	15. ______	
9. What salary per week (gross - before deductions) are you presently receiving?	Under $50	1. ______	29
	$ 50-$ 99	2. ______	
	$100-$149	3. ______	
	$150-$199	4. ______	
	$200-$249	5. ______	
	$250-$299	6. ______	
	$300-$349	7. ______	
	$350-$399	8. ______	
	$400-or more	9. ______	
10. What amount of income tax is deducted from your salary each week?	Under $20	1. ______	30
	$ 20-$ 39	2. ______	
	$ 40-$ 59	3. ______	
	$ 60-$ 79	4. ______	
	$ 80-$ 99	5. ______	
	$100-$119	6. ______	
	$120-$139	7. ______	
	$140-$159	8. ______	
	$160 or more	9. ______	

				Computer Use Only C.C.
11.	How would you rate your performance in your present occupation?	Exceptional	1. ______	31
		Superior	2. ______	
		Very good	3. ______	
		Above average	4. ______	
		Average	5. ______	
		Below average	6. ______	
		Poor	7. ______	
		Very poor	8. ______	
12.	Are you satisfied with your present position?	Very satisfied	1. ______	32
		Reasonably satisfied	2. ______	
		No opinion	3. ______	
		Somewhat dissatisfied	4. ______	
		Very dissatisfied	5. ______	
13.	Was the position you secured after leaving College related to the education and training you had received there?	Very much	1. ______	33
		Considerably	2. ______	
		Some	3. ______	
		Very little	4. ______	
		None	5. ______	
14.	In what type of job are you presently employed? (state job title)		______________	34
15.	What do you expect your gross earnings to be during the first year after leaving college?	Less than $2000	1. ______	35,36
		$2000 $3999	2. ______	
		$4000 $5999	3. ______	
		$6000 $7999	4. ______	
		$8000 $9999	5. ______	
		$10000 $11999	6. ______	
		$12000 $13999	7. ______	
		$14000 $15999	8. ______	
		$16000 $17999	9. ______	
		$18000 $19999	10. ______	
		$20000 $219999	11. ______	
		$22000 $239999	12. ______	
		$24000 and over	13. ______	

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16. What do you expect your 'take home' wages per month to be during the first year after leaving college?

Less than $200		1. ________	
$200	$399	2. ________	
$400	$599	3. ________	
$600	$799	4. ________	
$800	$999	5. ________	
$1000	$1199	6. ________	
$1200	$1399	7. ________	37,38
$1400	$1599	8. ________	
$1600	$1799	9. ________	
$1800	$1999	10. ________	
$2000	$2199	11. ________	
$2200	$2399	12. ________	
$2400 and over		13. ________	

PART II Satisfaction with College

What is your appraisal of the following aspects of the programme in which you were enrolled

		Poor	Below Average	Average	Very Good	Excellent	
		1	2	3	4	5	
17.	Quality of instruction						39
18.	Instructors' interest in students						41
19.	Preparation for job interview						42
20.	Assistance in overcoming learning difficulties						43
21.	Assistance to resolve personal problems						44
		1	2	3	4	5	
22.	Assistance in finding a job						45
23.	Achieving your educational and vocational goals						46

How well did your programme of studies prepare you for the following job requirements?

		Poor	Below Average	Satisfactory	Very Good	Superior	Computer Use Only C.C
		1	2	3	4	5	
24.	Mastery of technical skills						47
25.	Developing relationships with colleagues and public						48
26.	Personal appearance and conduct						49
27.	Readiness to accept responsibility						50
		1	2	3	4	5	/
28.	High level of dependability						51
29.	Ability to accept and follow instructions						52
30.	Express creativeness						53
31.	Exhibit initiative						54
32.	Being in regular attendance						55
		1	2	3	4	5	

33. To what extent was the training you received at college consistent with the tasks you have been assigned in you present job?

Very much 4.______
Some 3.______
Very little 2.______
Not at all 1.______

56

PART V Instructors

While attending college you were taught by several instructors, using the scale provided circle the most appropriate response for the given statements

		None of my instructors	A minority of my instructors	About half of my instructors	A majority of my instructors	All of my instructors	Computer Use Only
34.	Instructors present material in an entertaining (e.g., dramatic, humorous) manner.	1	2	3	4	5	57
35.	Instructors give personal opinions or describe personal experiences.	1	2	3	4	5	58
36.	Instructors seem to be "out of touch" with student life.	5	4	3	2	1	59
37.	Lectures are dry, dull, and monotonous.	5	4	3	2	1	60
38.	Faculty members have an unusual facility for communicating their knowledge to students.	1	2	3	4	5	61
39.	Instructors appear to be uneasy and nervous.	5	4	3	2	1	62
40.	Instructors criticize or embarrass students in the classroom.	5	4	3	2	1	63
41.	Instructors relate course material to contemporary problems.	1	2	3	4	5	64
42.	Insufficient distinction is made between major ideas and less important details.	5	4	3	2	1	65
43.	Instructors don't seem to care whether or not class material is understood.	5	4	3	2	1	66
44.	Students are given an important voice in determining class objectives and procedures.	1	2	3	4	5	67
45.	Out-of-class assignments (reading, papers, etc.) are reasonable in length.	1	2	3	4	5	68
46.	Instructors give students ample opportunity to participate in discussion, to ask questions, and to express points of view.	1	2	3	4	5	69
47.	Instructors give disorganized, superficial, or imprecise treatment to their material.	5	4	3	2	1	70

PART V Discontinuance of Attendance

When you decided to discontinue your studies, how important were the following factors in arriving at this decision

		Very Important				Not Important At All	Computer Use Only
48.	Could not afford to continue	1	2	3	4	5	
49.	You lacked adequate background knowledge and skills	1	2	3	4	5	
50.	You entered the armed forces	1	2	3	4	5	
51.	You transferred to another educational institution	1	2	3	4	5	
52.	You felt higher education had nothing to offer you	1	2	3	4	5	71-80
53.	You got married and became a homemaker	1	2	3	4	5	
54.	You found the course work too difficult	1	2	3	4	5	
55.	You secured a full-time position which you preferred to higher education	1	2	3	4	5	
56.	The sudden emergence of a personal problem	1	2	3	4	5	
57.	You had no sense of success in college work	1	2	3	4	5	
58.	You didn't feel higher education was meeting your personal needs	1	2	3	4	5	
59.	Unable to continue because of low grade point average	1	2	3	4	5	
60.	You felt you had an adequate education to find employment	1	2	3	4	5	
61.	You transferred to another programme	1	2	3	4	5	
62.	An unsatisfactory personal relationship with another student(s)	1	2	3	4	5	9-16
63.	An unsatisfactory personal relationship will instructor(s)	1	2	3	4	5	
64.	Illness	1	2	3	4	5	
65.	Other (specify) ________________	1	2	3	4	5	

Computer
Use Only
C.C

PART VI Recommendations for Improvement

What recommendations would you propose for improving

66. a) the programmes offered by the college

17,18

b) the student services offered by the college.
(guidance,housing recreation, dining etc.)

19,20

c) the social activities at the college

21,22

Computer
Use Only
C.C

d) the general organization of the college

23,24

67. Please feel free to comment on any issues related to college education that are of concern to you, that have not been mentioned in this questionnaire

25,26

Please check to see you have answered all the questions. This is most important.

Thank you very much for your cooperation and assistance.

Peter James Murphy

Vancouver Community College, Vancouver Vocational Institute, 250 West Pender,
Vancouver, B.C. V6B 1S9
Phone (604) 681-8111, Telex 04-[illegible]566

June 14, 1975

Dear Miss French:

Recently you received a questionnaire seeking your evaluation of the programme you attended at Vancouver Vocational Institute, which according to my records has not been returned, though possibly it is in the mail. If you still have the questionnaire in your possession, I would appreciate it being completed and returned as soon as possible. Again I would like to emphasize that the success of my study depends upon a high response rate from former students, therefore your continued co-operation and assistance would be very much appreciated.

Yours respectfully,

Peter James Murphy

APPENDIX E

SUPERVISOR'S QUESTIONNAIRE

FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL
ADMINISTRATION

THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA
T6G 2E1

March 1975

RE: Community College Programme Evaluation Study

Dear Sir/Ms.:

In an effort to provide our economy with skilled manpower it needs to sustain its present rate of economic growth, the Vancouver Community College is offering a wide range of programmes extending in duration from several weeks to two years. Though the College secures some 'feedback' from former students and employers concerning the value of courses, the faculty and administration always welcomes information that will enable them to provide young adults with programmes, that enable them to cope more effectively with the demands of the careers they follow after graduation.

As part of my Ph.D programme at the University of Alberta, I am developing a programme information system to assist the faculty and administration of the College obtain more detailed and precise information about the students they serve, the effectiveness of the programmes they provide and the opinion of employers. A number of employers in the area are consequently being approached to participate in this study.

Attached to this letter you will find the questionnaire I recently discussed with you over the telephone, which I would appreciate you completing at your earliest convenience. I realize that you have minimal time to devote to additional tasks outside your normal duties, however I can offer you my assurance that the time and effort you assign to the questionnaire will be worthwhile.

Furthermore, the responses of all employers who participate in this study will be analyzed in the strictest confidence and presented in a form, that prevents the identification of any specific individual.

Thanks once again for your co-operation and assistance.

Yours respectfully,

Peter James Murphy

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

UNIVERSITY OF ALBERTA

Community College Programme Evaluation Study

Supervisor's Questionnaire

In the spaces provided, please check the most appropriate answers to the following questions. All responses will be treated as confidential information. (Only check one response for each item.)

Computer Use Only C.C.

Surname: ____________________

First name: ____________________ **Identification No.** ____________________

Telephone No. ____________________

1,2,3,4,5,6 7,8

PART I Employer

1. Write the name and address of your present employer and indicate the subdivision of the company if it is appropriate. If you work for a government agency report the department, bureau, division or sector whichever applies.

Employer ____

Address ____

________________________________ **Telephone No.** ____________

Subdivision ____

Address ____

________________________________ **Telephone No.** ____________

2. Please write the job title of your new employee whom this questionnaire concerns.

Employee ____

Job Title ____

____

PART III Satisfaction with College Training and Education

How well do you consider the programme your new employee attended at College prepared him/her for the position they hold in your firm?

	Poor	Below Average	Average	Very Good	Superior	Compute Use Onl C.C.
	1	2	3	4	5	
9. Mastery of technical skills						15
10. Relationship with colleagues and public						16
11. Personal appearance and conduct						17
12. Readiness for additional responsibility						18
	1	2	3	4	5	
13. Ability to learn new tasks						19
14. Ability to accept and follow instructions						20
15. High level of dependability						21
16. Leadership potential						22
	1	2	3	4	5	
17. Being in regular attendance						23
18. Express creativeness						24
19. Exhibit initiative						25
20. Developing a positive attitude towards your job						26
	1	2	3	4	5	

			Computer Use Only C.C
21. Do you feel the training your new employee received at college was consistent with the tasks he/she is being assigned in his/her present job?	Very much	4. ______	27.
	Some	3. ______	
	Very little	2. ______	
	Not at all	1. ______	

PART IV Contact with College

22. How often in the last two years has the College contacted you?	Never	1. ______	28.
	Once	2. ______	
	Twice	3. ______	
	Three times	4. ______	
23. How often in the last two years have you contacted the College?	Never	1. ______	29.
	Once	2. ______	
	Twice	3. ______	
	Three times	4. ______	
	Four times or more (specify) ______________	5. ______	
24. How would you rate your relationship with the Community College?	Very satisfactory	1. ______	30.
	Reasonably satisfactory	2. ______	
	No opinion	3. ______	
	Somewhat dissatisfied	4. ______	
	Very dissatisfied	5. ______	
25. Do you have any difficulty obtaining information from the College about prospective employees?	Very much	1. ______	31.
	Considerable	2. ______	
	Some	3. ______	
	Very little	4. ______	
	None	5. ______	
26. Do you make any contribution to determining the content of the programmes offered by the College?	Very much	1. ______	32.
	Considerable	2. ______	
	Some	3. ______	
	Very little	4. ______	
	None	5. ______	

PART VI Recommendations for Improvement

Computer
Use Only
C.C

What recommendations would you propose for improving

27. a) the programmes offered by the college

33,34

b) the student services offered by the college.
(guidance, housing, recreation, dining etc.)

35,36

c) the social activities at the college

37,38

	Computer Use Only C.C
d) the general organisation of the college	39,40,
28. Have you any recommendations that would improve the relationship between the college and your firm?	41,42
29. Please feel free to comment on any issues related to college education that are of concern to you, that have not been mentioned in this questionnaire	43,44

Please check to see you have answered all the questions. This is most important.

Thank you very much for your cooperation and assistance.

Vancouver Community College, Vancouver Vocational Institute, 250 West Pender,
Vancouver, B.C. V6B 1S9

VCC

Phone (604) 681-8111, Telex 04-54566

June 14, 1975

Dear Mr. Davis:

Recently you received a questionnaire seeking your evaluation of a certain programme offered by the Vancouver Vocational Institute, which according to my records has not been returned, though possibly it is presently in the mail. If you still have the questionnaire in your possession, I would appreciate it being completed and returned as soon as possible. Again I would like to emphasize that the success of my study depends upon a high response rate from employers, therefore your co-operation and assistance would be very much appreciated.

Yours respectfully,

Peter James Murphy

APPENDIX F

GOALS INVENTORY

COMMUNITY COLLEGE PROGRAMME EVALUATION STUDY
GOALS INVENTORY

Community colleges are designed to achieve numerous institutional and instructional goals, which naturally will not be attained to the same degree, but neither would individuals want them to be emphasized equally. The following statements outline some of the major instructional goals that a community college could be trying to achieve through the programmes and services it provides. Using the response categories shown, please indicate the degree of importance that you feel should be placed on each goal and the degree of importance that is actually being placed on each goal by your local community college.

Before completing this inventory please examine the example that has been provided, where the respondent has indicated that he/she considers the goal 'develop the student to the maximum of his/her potential' is presently of low importance at the college, but that it should be of high importance.

		Of No Importance	Of Low Importance	Of Moderate Importance	Of High Importance	Of Extremely High Importance
'Develop the student to the maximum	IS	1	[✓ 2]	3	4	5
of his/her potential'	SHOULD BE	1	2	3	[✓ 4]	5

Surname ______________________ Identification Number ., 2, 3, 4, 5, 6, 7, 8

First Name ______________________ ______________________

INSTRUCTIONAL GOALS

		Of No Importance	Of Low Importance	Of Moderate Importance	Of High Importance	Of Extremely High Importance	Computer Use Only
1. IMPROVING MENTAL HEALTH The degree to which the student is able to cope with the pressures and stress experience in a rapidly changing environment in the world of work or in higher education, as a result of the experience at college.	IS	1	2	3	4	5	9, 10
	SHOULD BE	1	2	3	4	5	
2. DEVELOPING SPECIAL APTITUDES The extent to which the student is able to develop unique aptitudes that have been identified through testing and/or counseling.	IS	1	2	3	4	5	11, 12
	SHOULD BE	1	2	3	4	5	
3. IMPROVING INTER-PERSONAL RELATIONSHIPS The degree to which the student is able to relate better to other individuals or groups as a result of his college experience.	IS	1	2	3	4	5	13, 14
	SHOULD BE	1	2	3	4	5	
4. RAISING THE LEVEL OF SOCIAL STATUS The extent to which the student has actually raised his social status in the community by receiving a certificate, diploma, or degree.	IS	1	2	3	4	5	15, 16
	SHOULD BE	1	2	3	4	5	
5. DEVELOPING SOCIAL GRACES The degree to which the college assists the student to become more comfortable in social situations during his college experience.	IS	1	2	3	4	5	17, 18
	SHOULD BE	1	2	3	4	5	
6. DEVELOPING CREATIVITY The extent to which the student is able to design, produce, or otherwise bring into existence new and original products, ideas, or processes.	IS	1	2	3	4	5	19, 20
	SHOULD BE	1	2	3	4	5	

INSTRUCTIONAL GOALS

Goal		Of No Importance	Of Low Importance	Of Moderate Importance	Of High Importance	Of Extremely High Importance	Computer Use Only
7. **RAISING THE LEVEL OF EDUCATION ACHIEVEMENT** The extent to which the student has mastered tasks that he could not perform when he arrived at the college.	IS	1	2	3	4	5	21, 22
	SHOULD BE	1	2	3	4	5	
8. **IMPROVING SELF-CONCEPT** The extent to which the student sees himself as having increased worth and value as a human being as a result of his college experience.	IS	1	2	3	4	5	23, 24
	SHOULD BE	1	2	3	4	5	
9. **INCREASING BASIC SKILLS** The extent to which students are able to demonstrate basic skills across several broad fields (reading, writing, speaking, math, history, etc.)	IS	1	2	3	4	5	25, 26
	SHOULD BE	1	2	3	4	5	
10. **INCREASING SOCIAL RECOGNITION** Those awards and other honors granted to students by the college or by the community in recognition of outstanding achievement while attending the college.	IS	1	2	3	4	5	27, 28
	SHOULD BE	1	2	3	4	5	
11. **ASSISTING IN THE CHOICE OF A MAJOR OR CAREER** The degree to which the college has assisted the student in the selection of a program that meets his individual goals.	IS	1	2	3	4	5	29, 30
	SHOULD BE	1	2	3	4	5	
12. **INFLUENCING BASIC BELIEFS** The degree to which the student changes his range or moral guidelines, religious beliefs, and/or sexual beliefs during his college experience.	IS	1	2	3	4	5	31, 32
	SHOULD BE	1	2	3	4	5	

INSTRUCTIONAL GOALS

		Of No Importance	Of Low Importance	Of Moderate Importance	Of High Importance	Of Extremely High Importance	Computer Use Only
13. ASSISTING IN THE CHOICE OF AN AVOCATION The extent to which the college helps the student in the selection of leisure activities or hobbies.	IS	1	2	3	4	5	33, 34
	SHOULD BE	1	2	3	4	5	
14. RAISING LEVEL OF INCOME The extent to which the student is actually able to earn an increased salary or fee as a result of skills attained during the college experience.	IS	1	2	3	4	5	35, 36
	SHOULD BE	1	2	3	4	5	
15. STIMULATING INTEREST IN NEW AREAS The degree of desire in the student to continue self-initiated study - to participate in areas discovered through programs offered at the college.	IS	1	2	3	4	5	37, 38
	SHOULD BE	1	2	3	4	5	
16 INCREASING DRIVE TOWARD GOALS The extent to which a student is able to select a set of personal goals and to work toward accomplishing those goals during the college experience.	IS	1	2	3	4	5	39, 40
	SHOULD BE	1	2	3	4	5	
17. INCREASING PROBLEM-SOLVING ABILITY The extent to which the student demonstrates increased ability to correctly select and carry out principles and procedures for solving problems as a result of the college experience.	IS	1	2	3	4	5	41, 42
	SHOULD BE	1	2	3	4	5	
18. INSTILLING A SENSE OF CITIZENSHIP The extent to which the student has accepted a higher degree of responsibility for membership in the community as a result of his college experience.	IS	1	2	3	4	5	43, 44
	SHOULD BE	1	2	3	4	5	

INSTRUCTIONAL GOALS

		Of No Importance	Of Low Importance	Of Moderate Importance	Of High Importance	Of Extremely High Importance	Computer Use Only
19. IMPROVING CRITICAL THINKING The extent to which the student is able to demonstrate improved ability to exercise or employ careful judgements in making decisions in light of given information.	IS	1	2	3	4	5	45, 46
	SHOULD BE	1	2	3	4	5	
20. RAISING THE LEVEL OF VOCATIONAL ACHIEVEMENT The extent to which the student is able to demonstrate increased skills in his occupation as a result of his college experience.	IS	1	2	3	4	5	47, 48
	SHOULD BE	1	2	3	4	5	

PLEASE CHECK TO SEE YOU HAVE ANSWERED ALL THE ITEMS. THIS IS MOST IMPORTANT

THANK YOU VERY MUCH FOR YOUR COOPERATION AND ASSISTANCE

Peter James Murphy

APPENDIX G

FOLLOW-UP STUDIES

FOLLOW-UP STUDIES

Student Follow-Up

The literature on follow-up studies revealed that the major problem associated with this kind of survey was getting students to respond. Most follow-up studies were characterized by a low response rate, frequently only thirty-five per cent of those contacted replied. Upon examining several studies completed by graduate students from the Department of Educational Administration at the University of Alberta, the investigator found that high response rates were attained in investigations that focused on small samples, highly specialized programmes, or graduates who could be contacted through a professional association or trade union. In order to obtain high response rates the focus of these investigations had become very narrow.

The literature emphasized that for comprehensive follow-up studies to be successful, adequate consideration must be given to establishing good rapport with participants, securing the commitment of individuals by stressing the importance of their involvement, designing appropriate data gathering instruments, organizing the follow-up study, and preparing participants before they graduate from college. The investigator utilized many of these recommendations, as shown in Figure 39 for organizing the follow-up study conducted in this investigation.

Based on the literature reviewed and discussions with faculty members a tentative questionnaire was developed for obtaining

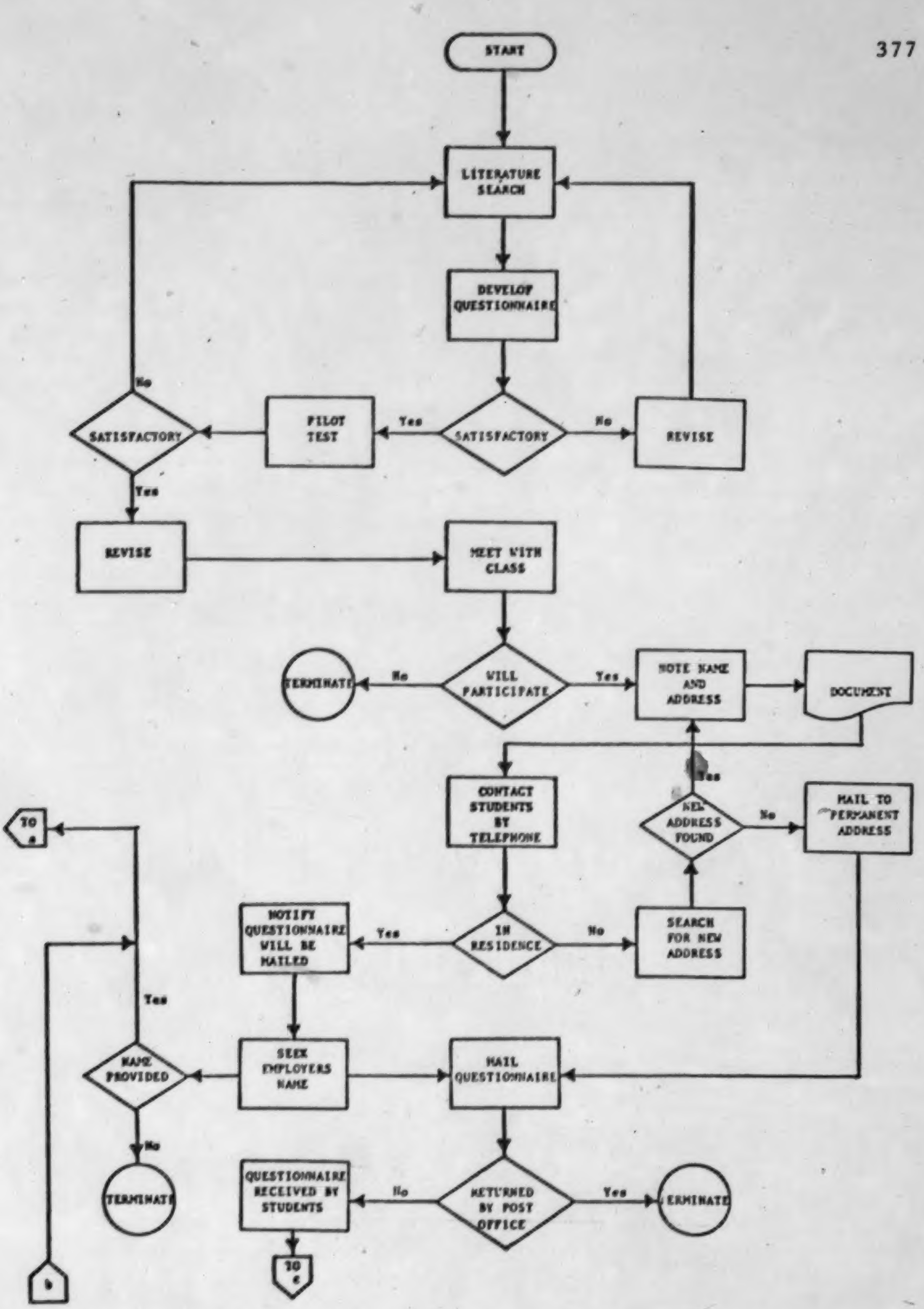

START
LITERATURE SEARCH
DEVELOP QUESTIONNAIRE
SATISFACTORY
No
REVISE
Yes
PILOT TEST
SATISFACTORY
No
Yes
REVISE
MEET WITH CLASS
WILL PARTICIPATE
No
TERMINATE
Yes
NOTE NAME AND ADDRESS
DOCUMENT
CONTACT STUDENTS BY TELEPHONE
NEW ADDRESS FOUND
Yes
No
MAIL TO PERMANENT ADDRESS
TO a
IN RESIDENCE
Yes
NOTIFY QUESTIONNAIRE WILL BE MAILED
No
SEARCH FOR NEW ADDRESS
Yes
NAME PROVIDED
SEEK EMPLOYERS NAME
MAIL QUESTIONNAIRE
No
TERMINATE
RETURNED BY POST OFFICE
No
QUESTIONNAIRE RECEIVED BY STUDENTS
Yes
TERMINATE
b
TO c

Figure 39

Graduate Follow-Up Study

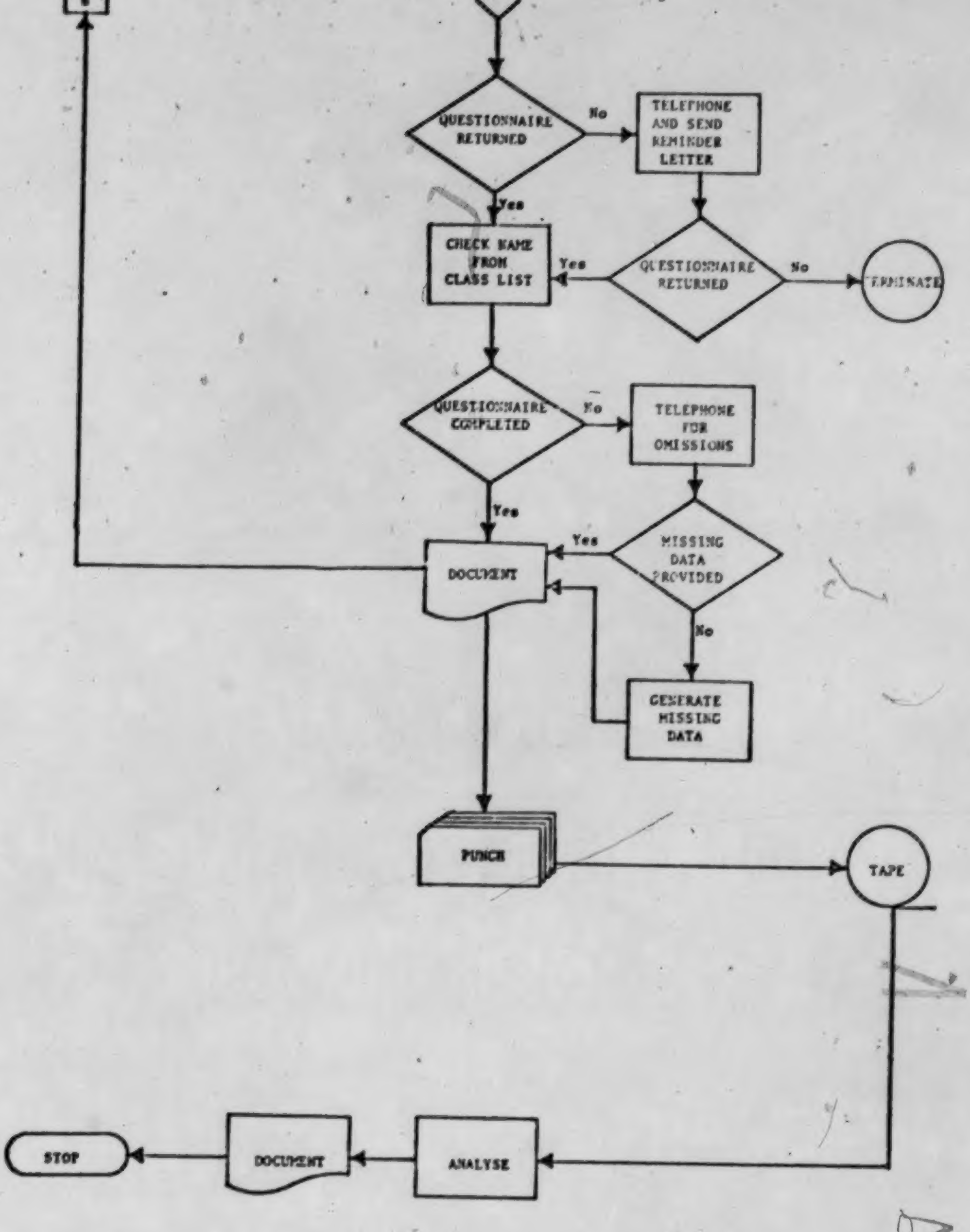

10
b
c
QUESTIONNAIRE RETURNED
No
TELEPHONE AND SEND REMINDER LETTER
Yes
CHECK NAME FROM CLASS LIST
Yes
QUESTIONNAIRE RETURNED
No
TERMINATE
QUESTIONNAIRE COMPLETED
No
TELEPHONE FOR OMISSIONS
Yes
DOCUMENT
Yes
MISSING DATA PROVIDED
No
GENERATE MISSING DATA
PUNCH
TAPE
STOP
DOCUMENT
ANALYSE

Figure 39 (Continued)

information from students after graduation. In order to determine the instrument's reliability and validity a pilot test was conducted at the Alberta Vocational Centre, which resulted in the provisional questionnaire being slightly modified.

The investigator arranged a meeting with the students participating in the study prior to them leaving College, to notify them that several weeks after graduation they would be receiving a questionnaire in the mail, requiring them to provide data on the following subjects:

1. Employer
2. Present Employment
3. Satisfaction with College
4. Instructors
5. Recommendations for Improvement

This information, in the investigators opinion, would provide some indication of whether students were employed in the type of occupations for which they had been trained, satisfied with the training they had received, and able to provide suggestions for improving the programmes offered by the College. The good rapport previously established combined with the obvious value of the data to be gathered resulted in the students being very interested and enthusiastic about the investigation.

Upon returning to the College in March, the investigator telephoned each participant to inform them they would be receiving a questionnaire in the near future, renew interest in the study, and discover whether they had secured productive employment. Many students indicated they were both surprised and pleased, that Vancouver Vocational Institute was sufficiently interested in their welfare after graduation to personally telephone them. It soon became apparent that the public relations of the College could be improved by merely telephoning former students.

During his conversation with the students the investigator enquired whether they objected to him contacting their employer. Though this matter had been discussed with the students prior to them leaving college, a large number were reluctant to provide this information especially in the food service programmes. This situation occurred, in the investigators opinion, because many of the students were new Canadians. Consequently they probably considered their continued employment might be jeopardized if they provided their employers name and address. More attention should have been given to eliminating such fears and anxiety while the students were attending college.

Though the response rates were high for such a diverse group of students (Table 54), after reflecting upon the procedures employed the investigator considers the follow-up study could have been considerably improved by placing greater emphasis on certain phases. Firstly, more time should have been devoted to describing the purpose of the follow-up study and explaining why feedback from students was important during the conferences prior to graduation. Secondly, the questionnaire would have been more effective if its size had been reduced, since the investigator found that the length of the instrument deterred some students from completing it. Thirdly, students while attending college should have been requested to provide two alternative addresses, because on several occasions the relative or friend as well as the student changed residence, consequently time was unnecessarily wasted trying to locate the former student. Finally, the impact of reminder letters on response rates should have been investigated to establish whether the return was worth the time, effort,and cost outlays involved.

Employer Follow-Up

The majority of the follow-up studies conducted at the community college level, according to the literature reviewed, generally focused on graduates success in either the labour market or institutions offering more advanced programmes. However,it was suggested in several investigations that employers should be included in future enquiries of this kind. The few studies reviewed that involved employers indicated they were usually very willing to participate if given the opportunity.

Upon being provided with the name of a students immediate supervisor,the investigator promptly telephoned the individual concerned to briefly outline the purpose of the study and encourage them to become involved in the investigation. One of the major problems encountered completing this stage of the study was the numerous telephone calls required to personally contact the supervisor. In large organizations several members of staff were often approached before the telephone numbers of the supervisor was obtained. While in other instances the supervisor was working in the field, attending conferences, or absent from work. When contacted however most supervisors indicated they would be willing to provide the information requested, in fact the general reaction of most individuals was very positive which possibly accounted for their high response rate (see Figure 40).

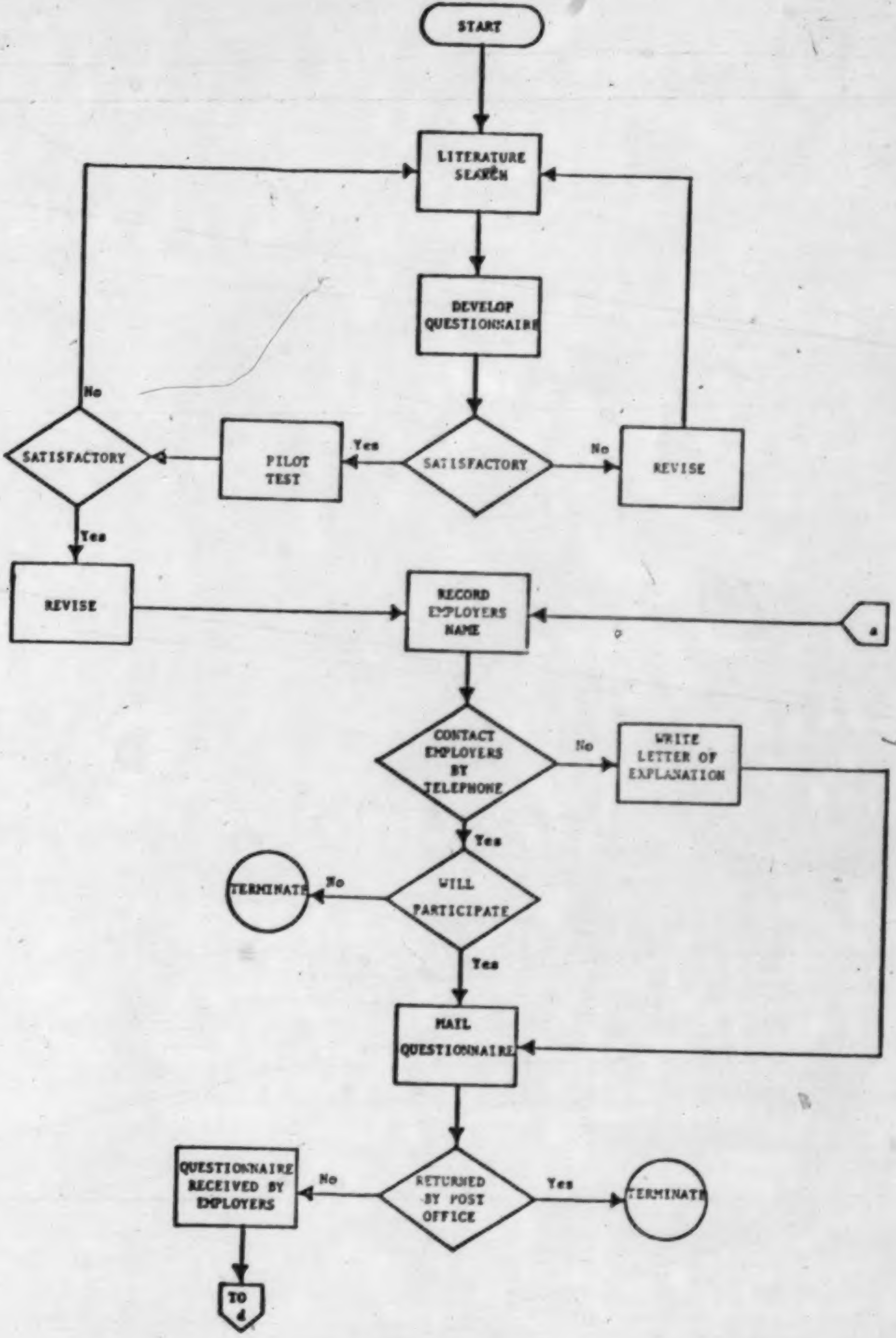
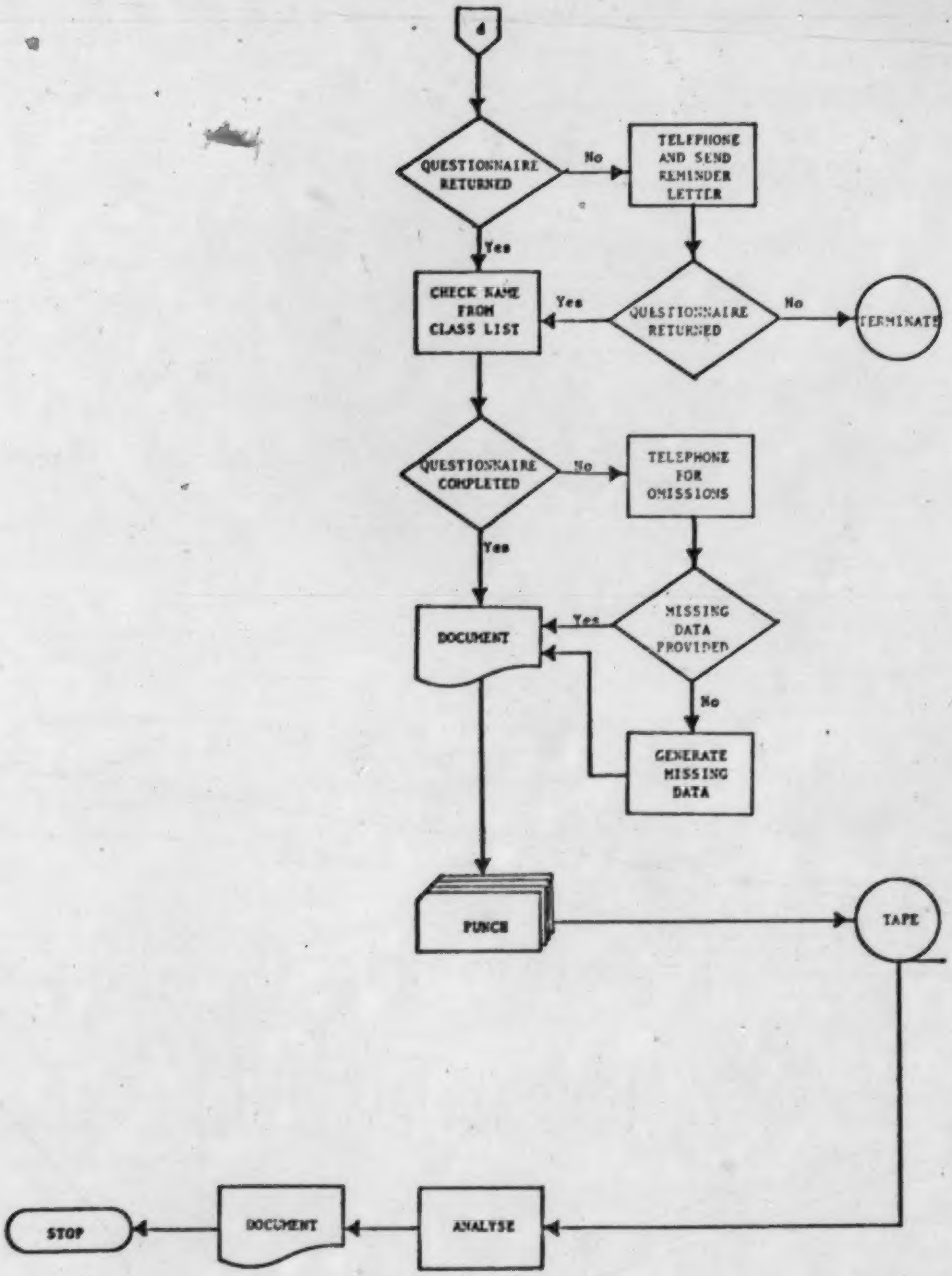

START
LITERATURE SEARCH
DEVELOP QUESTIONNAIRE
SATISFACTORY
Yes
No
REVISE
PILOT TEST
SATISFACTORY
No
Yes
REVISE
RECORD EMPLOYERS NAME
a
CONTACT EMPLOYERS BY TELEPHONE
No
WRITE LETTER OF EXPLANATION
Yes
WILL PARTICIPATE
No
TERMINATE
Yes
MAIL QUESTIONNAIRE
RETURNED BY POST OFFICE
No
QUESTIONNAIRE RECEIVED BY EMPLOYERS
Yes
TERMINATE
TO d

Figure 40

Employer Follow-Up Study



d
QUESTIONNAIRE RETURNED
No
TELEPHONE AND SEND REMINDER LETTER
Yes
CHECK NAME FROM CLASS LIST
Yes
QUESTIONNAIRE RETURNED
No
TERMINATE
QUESTIONNAIRE COMPLETED
No
TELEPHONE FOR OMISSIONS
Yes
DOCUMENT
Yes
MISSING DATA PROVIDED
No
GENERATE MISSING DATA
PUNCH
TAPE
STOP
DOCUMENT
ANALYSE

Figure 40 (Continued)

APPENDIX H

STATISTICAL COMPUTER PROGRAMMES

STATISTICAL COMPUTER PROGRAMMES

The statistical computer programmes outlined in this Appendix were developed by the staff of the Division of Educational Research Services at the University of Alberta for research conducted in the Faculty of Education. Provided in each summary is a short description of:

1. calculations performed
2. limits of the programme
3. type of input data that must be supplied
4. output generated

and in most instances a reference is provided where a description of the theoretical base of the programme can be found.

Division of Educational Research Services, 'Summary of Statistical Computer Programmes' (Edmonton: Division of Educational Research Services, Faculty of Education, University of Alberta, September, 1974).

Title	Correlated 't' Test (ANOV 12)
Machine	IBM 360/67
Language	Fortran IV (H)
Limits	100 variables
Programmer	W. Muir, D. Burnett
Description	This programme tests for the significance of difference between means and between variances for correlated samples. Both the 't' value matrix and corresponding probability matrix are calculated.
Input	Paired raw data.
Output	1. mean of each variable 2. standard deviation of each variable 3. correlation matrix 4. values of 'tij' for differences of variance 5. values of 'p' for each 'tij' for differences of variances 6. values g 'tij' for differences of means 7. values of 'p' for each 'tij' for differences of means

Example of Input Data

Control Cards	$SIGNON PASSWORD $EMPTY -LOAD# $SOURCE DERS: ANOV12
Title Card	CORRELATED 't' TEST
Parameter Card	bbb10 bbbb2 bbbb1

Format Card	(2F20)
	0705
	0915
Data Cards	.
	.
	.
	0606
	1216
Control Cards	$ENDFILE
	$SIGNOFF

Reference Ferguson, G. A. Statistical Analysis in Psychology and Education (New York:McGraw-Hill, 1966), pp. 169-171, 183-184.

Title	't' Test (ANOV10)
Machine	IBM 360/67
Language	FORTRAN IV (H)
Limits	100 variables
Programmer	J. Carlson, C. Hazlett
Description	This programme generates 't' values and their probability levels between two independent samples.
Input	Raw data
Output	1. 't' values and their probability levels 2. f ratios and their probability levels 3. Welch's approximation to 't' 4. Correlation matrix

Example of Input Data

Control Cards	$SIGNON
	PASSWORD
	$EMPTY -LOAD0
	$SOURCE DERS: ANOV10
Title Card	't' Test
Parameter Card	bbbb1 bbbb2 bbbb8 bbbb6
Format Card	(2(1xF2.0)
Data Cards	b14 b07
	b09 b10
	.
	.
	.
	b08 b40
Control Cards	$ENDFILE
	$SIGNOFF

Reference Ferguson, G. A. Statistical Analysis in Psychology and Education. (New York:McGraw-Hill, 1966), pp. 167-169, 172-173.

Title	Two-Way Analysis of Variance Fixed Effect Model with Unequal Observations in Each Cell (ANOV25).
Machine	IBM 360/67
Language	FORTRAN IV (H)
Limits	20 x 20 levels 30 variables

Programmer K. Bay

Description This program carries out two-way analysis of variance with equal or unequal observations per cell assuming fixed effect model.

i) Firstly the additive model (2) is tested against more general model applying least square techniques, i.e., interaction effect is tested:

$$Y_{ijk} = M + {}_{i} + {}_{j} + X_{ij} + e_{ijk} \qquad (1)$$

$$Y_{ijk} = M \,\&\, {}_{i} \,\&\, {}_{j} \,\&\, e_{ijk} \qquad (2)$$

ii) Using model (2) and least square method main effects $(\alpha_i),(\beta_j)$ are tested assuming no interaction exists. However, if by (i) interaction effect is found to be significant this lease square solution is meaningless.

iii) If model (1) is to be used, because the interaction is significant, the main effects $(\alpha_i),(\beta_j)$ are dependent on a weight system. The user must specify his option: unweighted or weighted main effects. If specific weight system is to be used it must be supplied by the user. In this case the sum of weights for each factor should be 1.

iv) The program also gives Scheffe's multiple comparison of main effects for both least square or weighted approach.

Input Raw data (group cells)

Output

1. cell matrix
2. test for additivity (interaction effect)

3. ANOVA table
4. Scheffe's multiple comparisons of main effects
5. Homogenerty of variance test using Bartlett's method
6. Cell means and variances

Example of Input Data

Control Cards	$SIGNON
	PASSWORD
	$EMPTY -LOAD#
	$SOURCE DERS:ANOV25
Title Card	Two-Way Analysis of Variance
Parameter Card	bbbb5 bbbb3 bbbb1 bbbb1 bbbb1
Format Card	(F4.0)
Vector Card	bbb18 bbb18 ....
Data Cards	4
	5
	. (cell(1,1)
	.
	.
	1
	5
	________
	3
	4
	. (cell(1,1)
	.
	.

```
                4
                4
                _________
                .
                .
                .
                _________
                4
                5
                .
                .      (cell(1,1)
                .
                4
                3
                _________
                blank card
Control Cards   $ENDFILE
                $SIGNOFF
```

Reference Winer, B. J. Statistical Principles in Experimental Design. (New York:McGraw-Hill Book Company, 1971).

APPENDIX I

SPECIAL COMPUTER PROGRAMMES

SPECIAL COMPUTER PROGRAMMES

Title	Data Re-arrangement
Machine	IBM 360/67
Language	FORTRAN (G)
Limits	230 data cards per group 9 variables per card Limits can be changed by altering the DIMENSION statement
Programmer	C. Prokop
Description	This programme was designed to re-arrange observations of participants located on IBM cards in fields of five integers, into cells containing only the response of groups to variables. The data had to be ordered in cells for a two-way analysis of variance test to be conducted.
Input	Raw data (individual responses)
Output	Raw data (group cells)

Example of Input Data

Control Cards

```
$SIGNON
PASSWORD
$GET  -A
$RUN  * FORT G
   DIMENSION X(230,9)
```

Programme

```
15 K=0
11 K=K+1
   READ(5,10,END=20)(X(K,I),I=1,9)
```

```
                    10 FORMAT(43X,9F1.0)
                       DO 13 J=1,6
                       IF(X(K,J).NE.0.0) GOTO 11
                    13 CONTINUE
                       GOTO 14
                    20 K=K-1
                       WRITE(8,12)((X(L,I),L=1,K),I=1,9)
                    12 FORMAT(F4.0)
                       GOTO 15
                    14 STOP
                       END
                    $ENDFILE
                    $RUN  -LOAD#   8=-A
Data Cards               - data cards -        (Division 1)
                    $ENDFILE
                         - data cards -        (Division II)
                    $ENDFILE
                         - data cards -        (Division III)
                    $ENDFILE
                         - data cards -        (Division IV)
                    $ENDFILE
                    $EMPTY  -LOAD#
Control Card        $SOURCE  DERS:ANOV25
Title Card          TWO-WAY ANALYSIS OF VARIANCE
Parameter Card      bbbb5 bbbb3 bbbb1 bbbb1 bbbb1
Format Card         (F4.0)
Vector Card         bbb18 bbb18 ....
```

Data File	$CONTINUE WITH -A RETURN
	- blank card -
Control Cards	$ENDFILE
	$SIGNOFF

Reference -

Title	Programme Goals
Machine	IBM 360/67
Language	FORTRAN (G)
Limits	200 cards per group 4 groups of participants Limits can be changed by altering the DIMENSION statement.
Programmer	C. Prokop
Description	This programme computes the mean values, standard deviation and response frequencies for participants perceptions of the present and preferred importance of a set of programme goals. The mean scores of importance assigned the variables by different groups are plotted on graphs.
Input	Raw data
Output	1. mean score for each variable 2. standard deviation for each variable 3. frequency distribution for each variable 4. graphs of mean score for each variable by group.

Example of Input Data

Control Cards

```
$SIGNON

PASSWORD

$RUN  *FORT G
```

Programme

```
      INTEGER *2 FREQU(6)
      INTEGER GRAPH(41,20),ISYM(4).TITLE(20)
      DIMENSION XMEAN(4,2,20),INP(200,2,20J,PERC(6)
      DATA ISYM/'*'.'/'.'+'.'-'/
      DATA IB/' '/
C
C LIMITATIONS: UP TO 4 DATA SETS PER RUN
                UP TO 200 CARDS PER DATA SET
C FIRST CARD BEFORE EACH DATA SET HAS TO BE A TITLE
  CARD STARTING IN COL. 1
C EACH DATA SET HAS TO BE FOLLOWED BY A $ENDFILE CARD
C PROGRAM TERMINATES IF A BLANK TITLE CARD IS ENCOUNTERED
C
      DO 10 I=1,3
      DO 10 J=1,2
      DO 10 K=1,20
   10 XMEAN(I,J,K) = 0.0
      NSET = 0
   51 READ(5,11) TITLE
   11 FORMAT(20A4)
      IF(TITLE(1).EQ.IB) GO TO 100
      NSET = NSET + 1
      I = 0
   13 I = I + 1
      READ(5,12,END=50) ((INP(I,J,K),J=1,2),K=1,20)
   12 FORMAT(6X,40I1)
      TO TO 13
   50 NC = I - 1
      DO 21 J=1,2
      WRITE(6,19) TITLE
   19 FORMAT(1H1,20A4//)
      IF(J.EQ.2) WRITE(6,23)
   23 FORMAT(IX,'PREFERRED')
      IF(J.EQ.1) WRITE(6,22)
   22 FORMAT(1X,'PRESENT')
      DO 24 K=1,20
      DO 25 L=1,6
      PERC(L) = 0.0
   25 FREQU(L) = 0
      XBAR = 0.0
      WRITE(6,26) K,(1,L=1,5)
```

Programme

```
 26 FORMAT(//' ITEM:',I3,5I10,5X,'TOTAL',6X,'MEAN',6X,'S.D.')
    DO 27 I=1,NC
    M = INP(I,J,K)
    IF(M.EQ.O.OR.M.GT.5) GO TO 27
    FREQU(M) = FREQU(M) + 1
    FREQU(6) = FREQU(6) +1
    XBAR = XBAR + M
 27 CONTINUE
    SD= 0.0
    X = FREQU(6)
    IF(X.EQ.0.0) GO TO 30
    XBAR = XBAR / X
    DO 28 I=1,NC
    Y = INP(I,J,K)
    IF(Y.GT.O.AND.Y.LE.5.0) SD = SD + (Y-XBAR)**2
 28 CONTINUE
    X = X - 1.0
    IF(X.GT.O.O) SD = SORT(SD)
    IF(SD.GT.O.O) SD = SORT(SD)
 30 WRITE(6,31) FREQU,XBAR,SD
 31 FORMAT(/9X,6I10,2F10.2)
    X = FREQU(6)
    IF(X.EQ.0.0) GO TO 34
    DO 33 L=1,6
 33 PERC(L) = FLOAT(FREQU(L)*100) / X
 34 WRITE(6,35) PERC
 35 FORMAT(9X,6(F9.2,'%'))
    XMEAN(NSET,J,K) = XBAR
 24 CONTINUE
    WRITE(6,19) TITLE
    WRITE(6,36) ISYM(1),ISYM(2)
 36 FORMAT(1X,'PRESENT:',1X,A1,3X,'PREFERRED:  ',A1//)
    DO 37 I=1,41
    DO 37 J=1,20
 37 GRAPH(I,J) = IB
    DO 38 I=1,2
    DO 38 J=1,20
    K = (XMEAN(NSET,I,J)+.05)*10.0 - 9.0
 38 GRAPH(K,J) = ISYM(I)
    K = 41
 40  X = (FLOAT(K+9)) / 10.0
    WRITE(6,39) X,(GRAPH;K,L),L=1,20)
 39 FORMAT(F6.1,' 1',20(3X,A1))
    K = K - 1
    IF(K.GE.1) GO TO 40
    WRITE(6,41) (K,K=1,20)
 41 FORMAT(7X,'1',80(1H-)/8X,20I4//46X,'ITEM')
    GO TO 51
100 IF(NSET.LE.1) STOP
    DO 70 I=1,2
    WRITE(6,61) NSET
 61 FORMAT(1H1,'GRAPH FOR THE',I2,' GROUPS OF DATA SETS'/)
    IF(I.EQ.1) WRITE(6,22)
```

```
      IF(I.EQ.2) WRITE(6,23)
      WRITE(6,62)(J,ISYM(J),J=1,NSET)
   62 FORMAT(15X,'GROUP',I2,': ',A1)
      WRITE(6,12)
      DO 63 J=1,41
      DO 63 K=1,20
   63 GRAPH(J,K) = IB
      DO 64 J=1,NSET
      DO 64 L=1,20
      K = (XMEAN(J,I,L)+.05)*10.0 - 9.0
      GRAPH(K,L) = ISYM(J)
   64 CONTINUE
      K = 41
   65  X = (FLOAT(K+9))/ 10.0
      WRITE(6,39) X,(GRAPH(K,L),L=1,20)
      K = K - 1
      IF(K.GE.1) GO TO 65
      WRITE(6,41) (K,K=1,20)
   70 CONTINUE
      STOP
      END
```

```
Control Cards       $ENDFILE

                    $RUN  -LOAD#

Title Card          GROUP 1 - STUDENTS

Data Cards              - data cards -

                    $ENDFILE

                    GROUP II - EMPLOYERS

                        - data cards -

                    $ENDFILE

                    GROUP III - FACULTY

                        - data cards -

                    $ENDFILE

                        - blank card -

Control Cards       $ENDFILE

                    $SIGNOFF
```

<u>Reference</u> -

Title	Programme Evaluation
Machine	IBM 360/67
Language	FORTRAN (G)
Limits	200 cards per group 4 groups of participants Limits can be changed by altering DIMENSION statement
Programmer	C. Prokop
Description	This programme computs the mean value, standard deviation and response frequencies for a set of variables that participants have been asked to evaluate. Also, the mean evaluation scores assigned the variables by different groups are plotted on a graph.
Input	Raw data
Output	1. mean score for each variable 2. standard deviation for each variable 3. frequency distribution for each variable 4. graphs of mean score for each variable by group

Example of Input Data

Control Cards

```
$SIGNON
PASSWORD
$RUN  *FORT G
```

Programme

```
      INTEGER*2 FREQU(6)
      INTEGER GRAPH
      DIMENSION XMEAN(4,2,20),INP(200,2,20),PERC(6)
      DATA ISYM/'*','-','+','-'/
      DATA IB/' '/
C
C LIMITATIONS:  UP TO 4 DATA SETS PER RUN
                UP TO 200 CARDS PER DATA SET
```

Programme

```
C FIRST CARD BEFORE EACH DATA SET HAS TO BE A TITLE CARD
  STARTING OUT IN COL. 1
C EACH DATA SET HAS TO BE FOLLOWED BY A $ENDFILE CARD
C PROGRAM TERMINATES IF A BLANK TITLE CARD IS ENCOUNTERED
C
      DO 10 I=1,4
      DO 10 J=1,1
      DO 10 K=1,9
   10 XMEAN(I,J,K,) = 0.0
      NSET = 0
   51 READ(5,11) TITLE
   11 FORMAT(20A4)
      IF(TITLE(1).EQ.IB) GO TO 100
      NSET = NSET + 1
      I = 0
   13 I = I + 1
      READ(5,12,END=50)ID,((INP(I,J,K),J=1,1),K=1,9)
   12 FORMAT(I6,37X,9I1,15X)
      KSUM=0
      DO 73 J=1,9
   73 KSUM=KSUM+INP(I,1,J)
      WRITE(9,74) ID,KSUM
   74 FORMAT(I6,I5)
      GO TO 13
   50 NC = I - 1
      DO 21 J=1,1
      WRITE(6,19) TITLE
   19 FORMAT(1H1,20A4//)
      DO 24 K=1,9
      DO 25 L=1,6
      PERC(L) = 0.0
   25 FREQU(L) = 0
      XBAR = 0.0
      WRITE(6,26) K,(L,I=1,5)
   26 FORMAT(//' ITEM:',I3,5I10,5X,'TOTAL',6X,'MEAN',6X,'S.D.')
      DO 27 I=1,NC
      M = INP(I,J,K)
      IF(M.EQ.0.OR.M.GT.5) GO TO 27
      FREQU(M) = FREQU(M) + 1
      FREQU(6) = FREQU(6) + 1
      XBAR = XBAR + M
   27 CONTINUE
      SD = 0.0
      X = FREQU(6)
      IF(X.EQ.0.0) GO TO 30
      XBAR = XBAR / x
      DO 28 I=1,NC
      Y = INP(I,J,K)
      IF (Y.GT.O.AND.Y.LE.5.0) SD = SD + (Y-XBAR)**2
   28 CONTINUE
      X = X - 1.0
      IF(X.GT.0.0) SD = SD / X
      IF(SD.GT.0.0) SD = SORT(SD)
```

Programme

```
 30 WRITE(6,31) FREQU,XBAR,SD
 31 FORMAT (/9X,6I10,2F10.2)
    X = FREQU(6)
    IF(X.EQ.0.0) GO TO 34
    DO 33 L=1,6
 33 PERC(L) = FLOAT(FREQU(L)*100) / X
 34 WRITE(6,35) PERC
 35 FORMAT (9X,6(F9.2,'%'))
    XMEAN(NSET,J,K) = XBAR
 24 CONTINUE
 21 CONTINUE
    GO TO 51
100 IF (NSET.LE.1) STOP
 39 FORMAT (F6.1,'1',20(3X,A1))
 41 FORMAT(7X,'1',80(1H-)/8X,20I4//46X,'ITEM')
    DO 70 I=1,1
    WRITE (6,61) NSET
 61 FORMAT (1H1,'GRAPH FOR THE',I2,' GROUPS OF DATA SETS'/)
    WRITE (6,62) (J,ISYM(J),J=1,NSET)
 62 FORMAT (15X,'GROUP',I2,': ',A1)
    WRITE (6,12)
    DO 63 J=1,41
    DO 63 K=1,9
 63 GRAPH (J,K) = IB
    DO 64 J=1,NSET
    DO 64 L=1,9
    K = (XMEAN(J,I,L)+.05)*10.0 - 9.0
    GRAPH(K,L) = ISYM(J)
 64 CONTINUE
    K = 41
 65  X = (FLOAT(K+9))/ 10.0
    WRITE(6,39) X,(GRAPH(K,L),L=1,9)
    K = K - 1
    IF(K.GE.1) GO TO 65
 70 CONTINUE
    STOP
    END
```

```
$END FILE
```

Control Cards

```
$RUN  -LOAD# 9=*PUNCH*
```

Title Card

```
EVALUATION OF VOCATIONAL TRAINING-BUSINESS DIVISION
```

Data Cards

```
    - data cards -

$ENDFILE
```

	EVALUATION OF VOCATIONAL TRAINING-SERVICE DIVISION
	- DATA CARDS -
	$ENDFILE
	EVALUATION OF VOCATIONAL TRAINING-TECHNICAL DIVISION
	- data cards -
	$ENDFILE
	- blank card
Control Cards	$ENDFILE
	$SIGNOFF
Reference	-

APPENDIX J

PROGRAMME GOALS - DIVISIONAL ANALYSIS

Table 62

Programme Goals

No.	Goal
1	Improving Mental Health
2	Developing Special Aptitudes
3	Improving Inter-Personal Relationships
4	Raising Level of Social Status
5	Developing Social Graces
6	Developing Creativity
7	Raising the Level of Education Achievement
8	Improving Self Concept
9	Increasing Basic Skills
10	Increasing Social Recognition
11	Assisting in the Choice of a Major Career
12	Influencing Basic Beliefs
13	Assisting in the Choice of an Avocation
14	Raising Level of Income
15	Stimulating Interest in New Areas
16	Increasing Drive Toward Goal
17	Increasing Problem-Solving Ability
18	Instilling a Sense of Citizenship
19	Improving Critical Thinking
20	Raising the Level of Vocational Achievement

Table 63

Mean Scores, Standard Deviations and Rank Order of Present Importance of Programme Goals as Perceived by Students in the Business Division
N=23

Present Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	3.61	1.03	1.0
4	3.48	1.04	2.0
7	3.39	1.16	3.0
14	3.13	0.87	4.0
16	3.00	1.00	5.0
9	2.78	0.95	6.0
8	2.74	1.05	7.5
19	2.74	1.05	7.5
15	2.61	1.08	9.0
17	2.57	0.90	10.0
2	2.43	1.34	11.0
18	2.39	0.99	12.0
3	2.35	1.03	13.0
6	2.30	1.22	14.0
1	2.26	1.14	15.0
10	2.17	0.94	16.5
11	2.17	1.11	16.5
5	2.13	1.01	18.0
12	1.57	0.79	19.0
13	1.30	0.63	20.0

Table 64

Mean Scores, Standard Deviations and Rank Order of Present Importance of Programme Goals as Perceived by Students in the Service Division

N=47

Present Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	3.55	0.80	1.0
7	3.45	0.95	2.0
8	3.43	1.04	3.0
19	3.30	0.81	4.0
6	3.28	0.95	5.0
14	3.26	1.09	6.0
3	3.19	1.10	7.0
9	3.15	1.08	8.0
18	3.13	1.06	9.0
16	3.11	1.15	10.0
10	3.09	1.02	11.0
17	3.04	1.10	12.0
4	2.96	1.14	13.0
15	2.87	1.01	14.0
11	2.79	1.16	15.0
1	2.74	0.92	16.0
5	2.68	1.00	17.0
2	2.55	0.97	18.0
12	2.21	1.10	19.0
13	2.00	1.10	20.0

Table 65

Mean Scores, Standard Deviations and Rank Order of Present Importance of Programme Goals as Perceived by Students in the Technical Division
N=41

Present Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	3.98	0.96	1.0
7	3.73	0.95	2.0
14	3.68	1.01	3.0
19	3.44	0.87	4.0
8	3.34	1.04	5.0
17	3.37	0.99	6.0
4	3.17	0.77	7.0
16	3.15	0.96	8.0
6	3.07	0.91	9.0
11	2.98	1.17	10.0
9	2.95	0.86	11.0
15	2.93	0.91	12.0
3	2.78	1.01	13.5
18	2.78	0.94	13.5
2	2.76	1.02	15.0
1	2.71	0.75	16.0
10	2.51	0.95	17.0
5	2.41	0.89	18.0
12	1.85	0.94	19.0
13	1.76	0.80	20.0

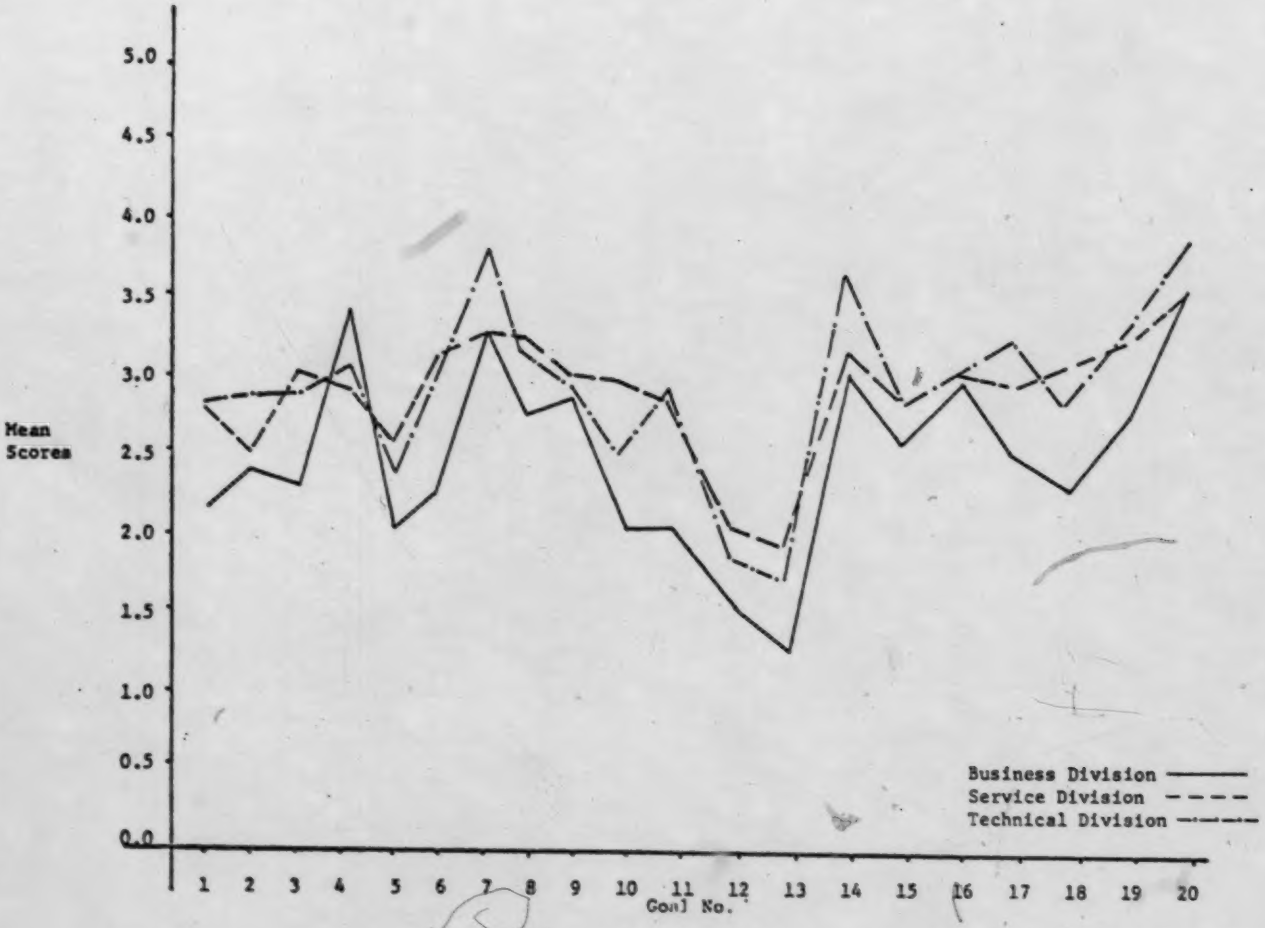


Figure 41

Graphical Presentation of Mean Scores of Present Importance of Programme Goals as Perceived by the Students in the Three Occupational Divisions.

Table 66

Mean Scores of Main Effects: Programme Goals - Present Importance

	Programme Goal																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Mean Scores	2.57	2.58	2.77	3.20	2.41	2.89	3.52	3.17	2.96	2.59	2.65	1.88	1.69	3.36	2.80	3.08	2.99	2.77	3.16	3.71

Table 67

Mean Scores of Main Effects: Occupational Divisions - Present Importance of Programme Goals

	Division		
	Business	Service	Technical
Mean Scores	2.56	3.00	2.97

Table 68

Analysis of Variance of Present Importance of Programme Goals as Perceived by the Students in Three Occupational Divisions

Source of Variation	SS	df	MS	F	p
Programme Goals	467.25	19	24.59	24.67	0.000000
Divisions	65.11	2	32.56	32.67	0.000000
Goals x Divisions	65.29	38	1.72	1.72	0.004048
Within	2152.82	2160	0.99		
Total	2750.47	2219			

Mean Scores
  Programme Goals (Table 66)
  Divisions (Table 67)
  Goals x Divisions (Tables 63, 64 and 65)
$p < 0.1$

Table 69

Scheffes Multiple Comparison of Main Effects: Difference Among Occupational Divisions in Terms of Students Perceptions of Present Importance of Programme Goals

Divisions	Contrast	F	p
1 2	-0.432	28.886	0.000000
1 3	-0.411	24.918	0.000000
2 3	-0.021	0.099	0.906000

Group 1	Business Division	N=23
Group 2	Service Division	N=47
Group 3	Technical Division	N=41

$p < 0.1$

Table 70

Mean Scores, Standard Deviations and Rank Order of Preferred Importance of Programme Goals as Perceived by Students in the Business Division
N=23

Preferred Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
7	4.65	0.49	1.0
20	4.48	0.59	2.5
9	4.48	0.67	2.5
14	4.35	0.65	4.5
11	4.35	0.71	4.5
16	4.30	0.76	6.0
8	4.13	0.97	7.0
1	4.09	0.49	8.5
19	4.09	0.73	8.5
2	4.04	0.71	10.5
6	4.04	0.98	10.5
15	4.00	0.95	12.0
3	3.83	0.65	13.0
17	3.74	0.75	14.0
5	3.57	0.90	15.0
4	3.52	1.31	16.0
18	3.48	1.20	17.0
10	3.39	1.12	18.0
12	2.04	1.19	19.0
13	2.30	1.11	20.0

Table 71

Mean Scores, Standard Deviations and Rank Order of Preferred Importance of Programme Goals as Perceived by Students in the Service Division

N=47

	Preferred Importance		
Goal No.	Mean Score	Standard Deviation	Rank Order
20	4.23	0.67	1.0
8	4.15	0.93	2.0
6	4.13	0.68	3.0
7	4.09	0.72	4.0
11	4.04	0.91	5.5
14	4.04	0.88	5.5
19	4.02	0.71	7.0
3	3.83	0.89	8.5
17	3.83	0.76	8.5
18	3.81	0.88	10.0
16	3.79	0.95	11.0
1	3.77	0.76	12.0
5	3.72	0.88	13.0
15	3.70	0.83	14.0
9	3.57	0.93	15.0
2	3.51	1.02	16.0
4	3.49	1.18	17.0
10	3.47	1.06	18.0
13	2.51	1.20	19.0
12	2.28	1.25	20.0

Table 72

Mean Scores, Standard Deviations and Rank Order of Preferred Importance of Programme Goals as Perceived by Students in the Technical Division
N=41

Preferred Importance			
Goal No.	Mean Score	Standard Deviation	Rank Order
20	4.54	0.64	1.0
7	4.39	0.59	2.0
11	4.07	0.96	3.0
16	4.05	0.77	4.0
17	4.02	0.82	5.5
19	4.02	0.91	5.5
6	4.00	0.71	7.0
14	3.98	0.85	8.0
8	3.93	0.98	9.0
15	3.83	0.80	10.0
9	3.61	0.80	11.0
1	3.59	0.77	12.0
3	3.51	0.87	13.0
2	3.49	0.98	14.0
4	3.29	0.90	15.0
5	3.05	1.05	16.0
18	3.07	0.98	17.0
10	2.98	0.90	18.0
13	2.29	0.90	19.0
12	2.12	1.19	20.0

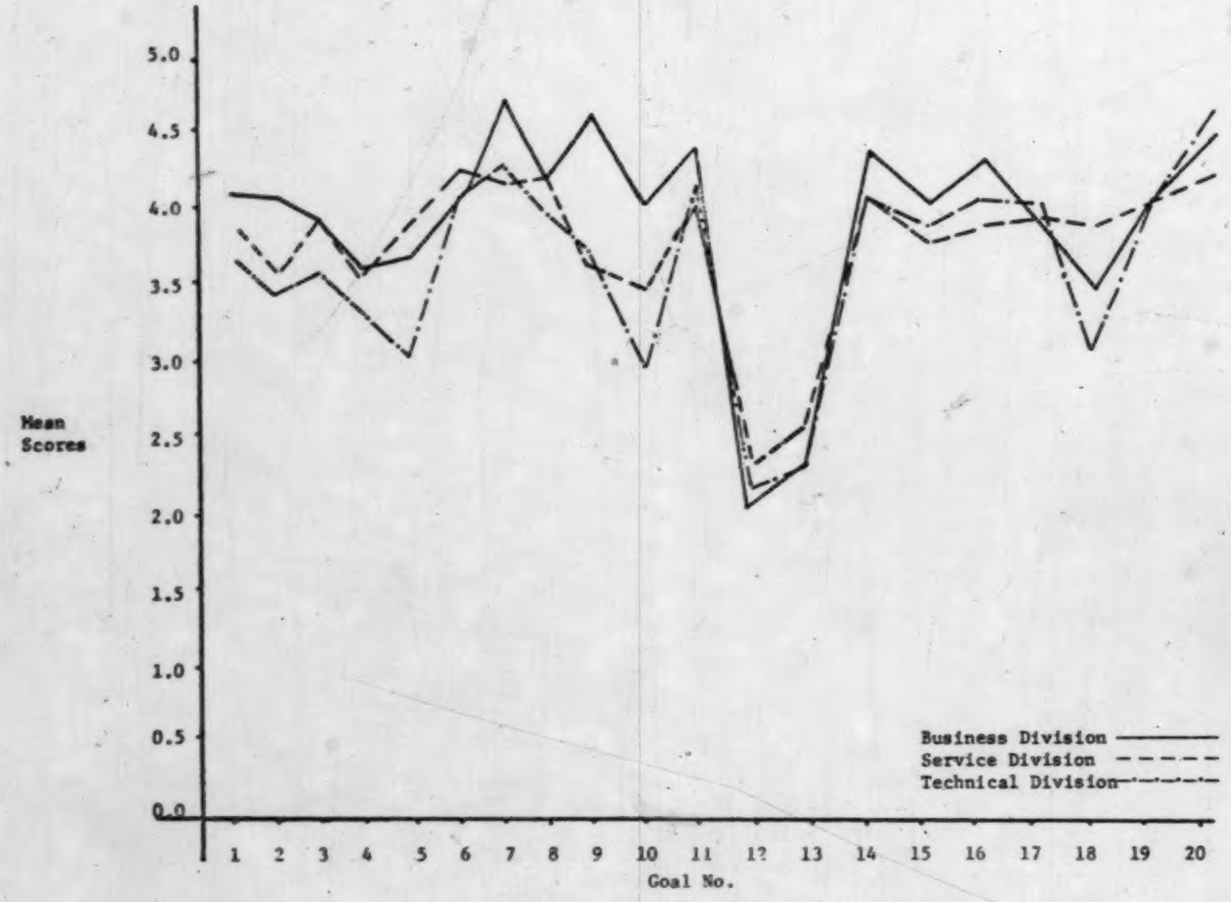


Figure 42

Graphical Presentation of Mean Scores of Preferred Importance of Programme Goals as Perceived by the Students in the Three Occupational Divisions

Table 73

Mean Scores of Main Effects: Programme Goals - Preferred Importance

	Programme Goal																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Mean Scores	3.81	3.68	3.72	3.43	3.45	4.06	4.38	4.07	3.89	3.28	4.16	2.15	2.37	4.12	3.84	4.05	3.86	3.45	4.04	4.42

Table 74

Mean Scores of Main Effects: Occupational Divisions - Preferred Importance of Programme Goals

	Division		
	Business	Service	Technical
Mean Scores	3.84	3.70	3.59

Table 75

Analysis of Variance of Preferred Importance of Programme Goals as Perceived by the Students in the Three Occupational Divisions

Source of Variation	SS	df	MS	F	p
Programme Goals	656.91	19	34.57	42.88	0.000000
Divisions	18.90	2	9.45	11.72	0.000009
Goals x Divisions	58.57	38	1.54	1.91	0.000709
Within	1741.80	2160	0.81		
Total	2476.20	2219			

Mean Scores
  Goals (Table 73)
  Divisions (Table 74)
  Goals x Divisions (Tables 70, 71 and 72)
$p < 0.1$

Table 76

Scheffes Multiple Comparison of Main Effects: Difference Among Occupational Divisions in Terms of Students Perceptions of Preferred Importance of Programme Goals

Division	Contrast	F	P
1 2	0.145	4.001	0.018433
1 3	0.252	11.605	0.000010
2 3	0.108	3.137	0.043632

Group 1	Business Division	N=23
Group 2	Service Division	N=47
Group 3	Technical Division	N=41

$p < 0.1$

APPENDIX K

Learning Environment - Business Division

Table 77

Learning Environment Dimensions

Dimension No.	Description
1	Quality of Instruction
2	Instructors Interest in Students
3	Preparation for Job Interview
4	Assisting in Overcoming Learning Difficulties
5	Assistance to Resolve Personal Problems
6	Assistance in Finding a Job
7	Achieving Educational and Vocational Goals

Table 78

Graduates' Evaluations of Learning Environment in Business Division Programmes

N=28

Business Division	Evaluations			
Programme	Dimension No.	Mean Score	Standard Deviation	Rank Order
Commercial	2	3.57	0.98	1.5
Basic	5	3.57	0.79	1.5
	6	3.14	0.38	3.0
N=7	3	2.86	0.90	4.0
	1	2.71	1.11	5.5
	7	2.71	0.95	5.5
	4	2.43	0.53	7.0
Medical	6	4.60	0.55	1.0
Stenographer	2	4.40	0.55	2.0
	1	4.20	0.45	3.0
N=5	4	3.80	0.45	4.5
	7	3.80	0.45	4.5
	3	3.60	1.52	6.5
	5	3.60	0.55	6.5
Commercial	2	3.80	0.45	1.0
Secretarial	6	3.40	1.14	2.0
	1	3.20	0.84	3.5
N=5	4	3.20	0.84	3.5
	3	2.80	1.10	5.5
	7	2.60	0.55	5.5
	5	2.60	0.89	7.0
Medical	6	3.55	0.69	1.0
Office	5	3.27	1.01	2.0
Assistant	2	2.82	1.25	3.5
	7	2.82	1.17	3.5
N=11	1	2.80	0.79	5.0
	4	2.64	0.92	6.0
	3	2.36	0.92	7.0

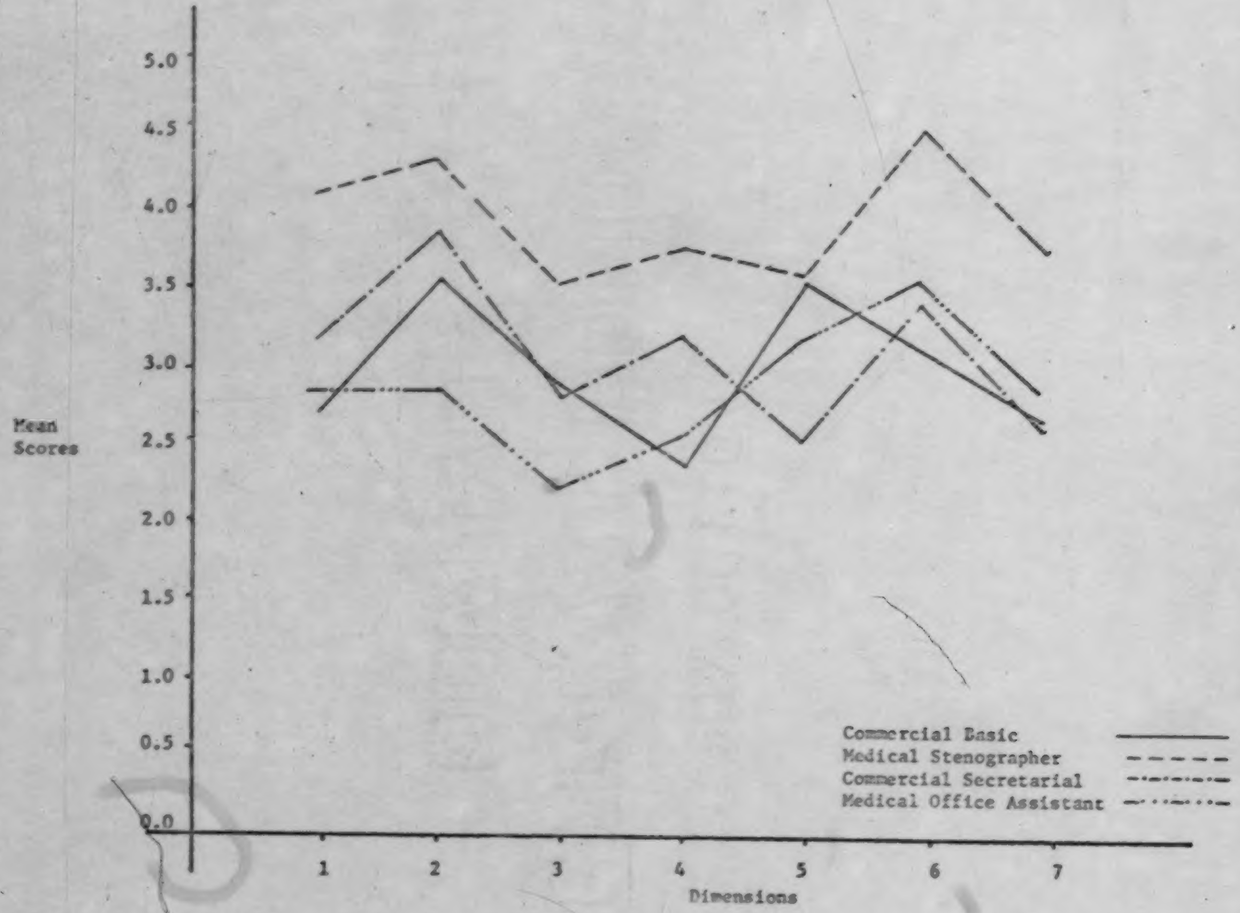


Figure 43

Graphical Presentation of Graduates' Evaluations of the Learning Environment in Business Division Programmes

Table 79

Mean Scores of Main Effects: Learning Environment Dimensions

	Learning Environment Dimension						
	1	2	3	4	5	6	7
Mean Scores	3.16	3.65	2.91	3.01	3.26	3.67	2.98

Table 80

Mean Scores of Main Effects: Graduate Groups

	Group			
	Commercial Basic	Medical Stenographer	Commercial Secreatarial	Medical Office Assistant
Mean Scores	3.00	4.00	3.09	2.86

Table 81

Analysis of Variance of Graduates' Evaluations of the Learning Environment in the Business Division

Source of Variation	SS	df	MS	F	p
Learning Environment Dimensions	14.82	6	2.469	2.97	0.008810
Groups	33.11	3	11.037	13.27	0.000002
Dimensions x Groups	13.78	18	0.766	0.92	0.554703
Within	139.72	168	0.832		
Total	201.43	195			

Mean Scores
  Dimensions (Table 79)
  Groups (Table 80)
  Dimensions x Groups (Table 78)
$p < 0.1$

Table 82

Scheffes Multiple Comparison of Main Effects: Difference Among Graduates' Evaluations of the Learning Environment in the Business Division

Groups	Contrast	F	p
1 2	-1.000	8.183	0.000044
1 3	0.086	0.060	0.980627
1 4	0.143	0.245	0.864853
2 3	0.914	5.863	0.000790
2 4	0.114	12.597	0.000002
3 4	0.229	0.504	0.680126

Group 1	Graduates - Commercial Basic	N=7
Group 2	Graduates - Medical Stenographer	N=5
Group 3	Graduates - Commercial Secretarial	N=5
Group 4	Graduates - Medical Office Assistant	N=11

$p < 0.1$

APPENDIX L

VOCATIONAL TRAINING - SERVICE DIVISION

Table 83

Vocational Skills

Skill	Description
1	Mastery of Technical Skills
2	Developing Relationships with Colleagues and Public
3	Personal Appearance
4	Readiness to Accept Responsibility
5	High Level of Dependability
6	Ability to Accept and Follow Instructions
7	Express Creativeness
8	Exhibit Initiative
9	Being in Regular Attendance

Table 84

Graduates' and Dropouts' Evaluations of the Vocational Skills Taught in the Service Division Programmes

N=48

Service Division	Evaluations			
Programme	Skill No.	Mean Score	Standard Deviation	Rank Order
Beauty Culture	9	3.92	0.75	1.0
	4	3.85	0.55	2.0
	3	3.69	0.63	4.0
N=13	5	3.69	0.85	4.0
	6	3.69	0.63	4.0
	2	3.62	0.65	6.0
	1	3.38	0.51	7.0
	7	3.31	0.95	8.5
	8	3.31	0.85	8.5
Waiter/ Waitress	6	4.00	0.63	1.0
	9	3.82	0.60	2.0
	2	3.45	0.82	3.5
N=11	3	3.45	0.82	3.5
	4	3.36	0.67	5.5
	5	3.36	0.50	5.5
	8	3.27	0.79	7.0
	1	3.09	0.30	8.0
	7	3.00	0.89	9.0
Short-Order Cook	9	3.78	1.00	1.0
	6	3.72	0.96	2.0
	2	3.61	1.14	3.5
N=18	3	3.61	1.14	3.5
	4	3.56	1.10	5.0
	5	3.44	1.25	6.0
	7	3.39	1.09	7.0
	1	3.33	1.03	8.0
	8	3.28	0.89	9.0
Dental Technician	6	3.83	0.41	1.0
	5	3.67	0.52	3.0
	7	3.67	0.82	3.0
N=6	9	3.67	0.52	3.0
	1	3.50	0.55	6.0
	4	3.50	0.55	6.0
	8	3.50	0.84	6.0
	2	3.00	1.10	8.5
	3	3.00	0.63	8.5

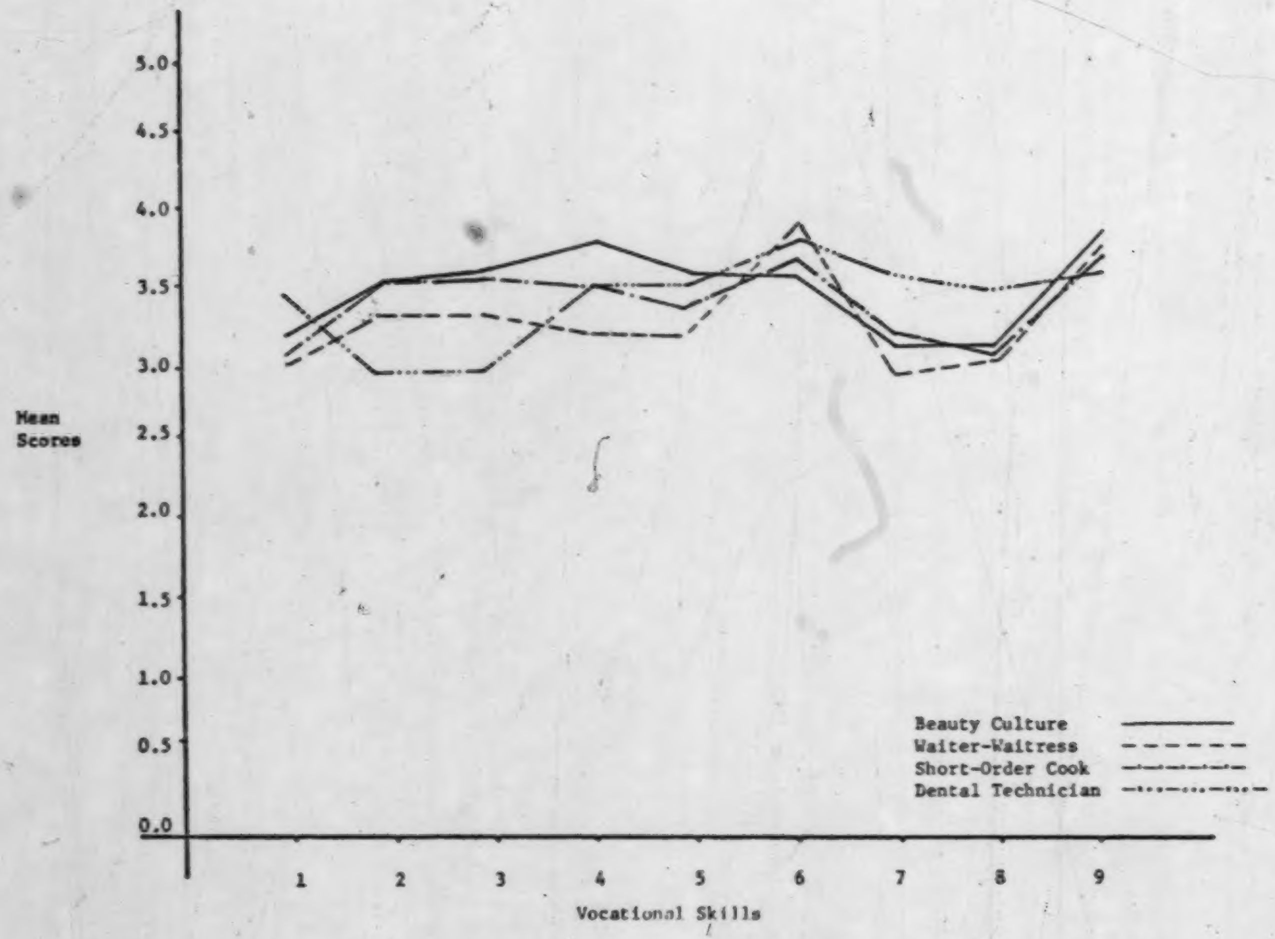


Figure 44

Graphical Presentation of Graduates' Evaluations of the Vocational Skills Taught in the Service Division Programmes

Table 85

Mean Scores of Main Effects: Vocational Skills

	Vocataional Skill								
	1	2	3	4	5	6	7	8	9
Mean Scores	3.33	3.42	3.44	3.57	3.54	3.81	3.34	3.34	3.80

Table 86

Mean Scores of Main Effects: Graduate Groups

	Group			
	Beauty Culture	Waiter/ Waitress	Short-Order Cook	Dental Technician
Mean Scores	3.61	3.42	3.53	3.48

Table 87

Analysis of Variance of Graduates' and Dropouts' Evaluations of the Vocational Skills Taught in Service Division Programmes

Source of Variation	SS	df	MS	F	p
Vocational Skills	11.547	8	1.443	1.95	0.051711
Groups	1.871	3	0.624	0.84	0.471484
Skills x Groups	8.625	24	0.359	0.49	0.982135
Within	293.297	396	0.741		
Total	315.340	431			

Mean Scores
  Skills (Table 85)
  Groups (Table 86)
  Skills x Groups (Table 84)
$p < 0.1$

Table 88

Scheffes Multiple Comparison of Main Effects: Difference Among Graduates' and Dropouts' Evaluations the Vocational Skills Taught in the Service Division Programmes

Groups	Contrast	F	p
1 2	0.183	8.047	0.491892
1 3	0.082	2.063	0.892032
1 4	0.125	2.613	0.853325
2 3	-0.100	2.790	0.840587
2 4	-0.057	0.052	0.984548
3 4	0.043	0.340	0.991575

Group 1	Beauty Culture	N=13
Group 2	Waiter/Waitress	N=11
Group 3	Short-Order Cook	N=18
Group 4	Dental Technician	N=6

$p < 0.1$

APPENDIX M

INSTRUCTION - TECHNICAL DIVISION

Table 89

Instructional Practices

Practice No.	Description
1	Presentation of Material
2	Utilization of Personal Experiences
3	Familiarity with Student Life
4	Quality of Lectures
5	Communication of Knowledge
6	Instructor's Confidence and Poise
7	Criticism of Students
8	Relating Material to Contemporary Problems
9	Distinguishing between Major and Minor Ideas
10	Ensuring Students Understand Material Taught
11	Participation of Students in Determining Class Objectives and Procedures
12	Out-of-Class Assignments
13	Opportunities for Students to Participate in Discussions
14	Organization of Material

Table 90

Graduates' Evaluations of the Instructional Practices of Faculty Members in the Technical Division
N=38

Technical Division	Evaluations			
Programme	Practice No.	Mean Score	Standard Deviation	Rank Order
Architectural and Mechanical Drafting	6	4.92	0.29	1.5
	10	4.92	0.29	1.5
	7	4.62	0.49	3.0
	14	4.50	0.80	4.0
N=12	13	4.42	0.90	5.0
	9	4.33	0.78	6.0
	2	3.83	1.11	7.0
	3	3.50	0.90	8.5
	4	3.50	1.00	8.5
	8	3.42	1.44	10.0
	12	3.17	1.70	11.0
	1	2.58	1.08	12.5
	5	2.58	0.79	12.5
	11	1.92	0.79	14.0
Architectural and Structural Drafting	13	4.67	0.71	1.0
	6	4.44	1.33	2.0
	10	4.11	1.36	3.5
	14	4.11	1.05	3.5
N=9	2	3.89	1.05	5.5
	9	3.89	1.17	5.5
	3	3.67	1.00	7.5
	12	3.67	1.58	7.5
	8	3.56	1.01	9.0
	7	3.44	1.01	10.0
	4	3.33	1.12	11.0
	1	3.11	1.05	12.0
	5	2.67	0.87	13.0
	11	1.67	0.87	14.0

Table 90 (Continued)

Technical Division		Evaluations		
Programme	Practice No.	Mean Score	Standard Deviation	Rank Order
Electricity and Industrial Electronics	6	4.78	0.44	1.0
	2	4.44	0.88	2.5
	14	4.44	0.73	2.5
	10	4.22	0.83	4.0
N=9	13	3.78	1.48	5.0
	12	3.67	0.87	6.0
	4	3.44	1.13	7.0
	7	3.22	1.09	8.5
	9	3.22	1.20	8.5
	8	3.11	1.05	10.0
	5	3.00	1.12	11.0
	1	2.89	1.36	12.0
	3	2.33	1.12	13.0
	11	2.00	1.12	14.0
Electro-Mechanics	6	4.75	0.46	1.0
	2	4.63	0.52	3.5
	7	4.63	0.74	3.5
N=8	10	4.63	0.52	3.5
	14	4.63	0.74	3.5
	13	4.50	0.53	6.0
	3	4.25	1.16	7.0
	4	3.63	1.19	8.0
	8	3.50	1.60	9.5
	9	3.50	1.60	9.5
	1	3.25	1.75	11.5
	5	3.25	1.16	11.5
	12	2.88	1.25	13.0
	11	2.75	1.16	14.0

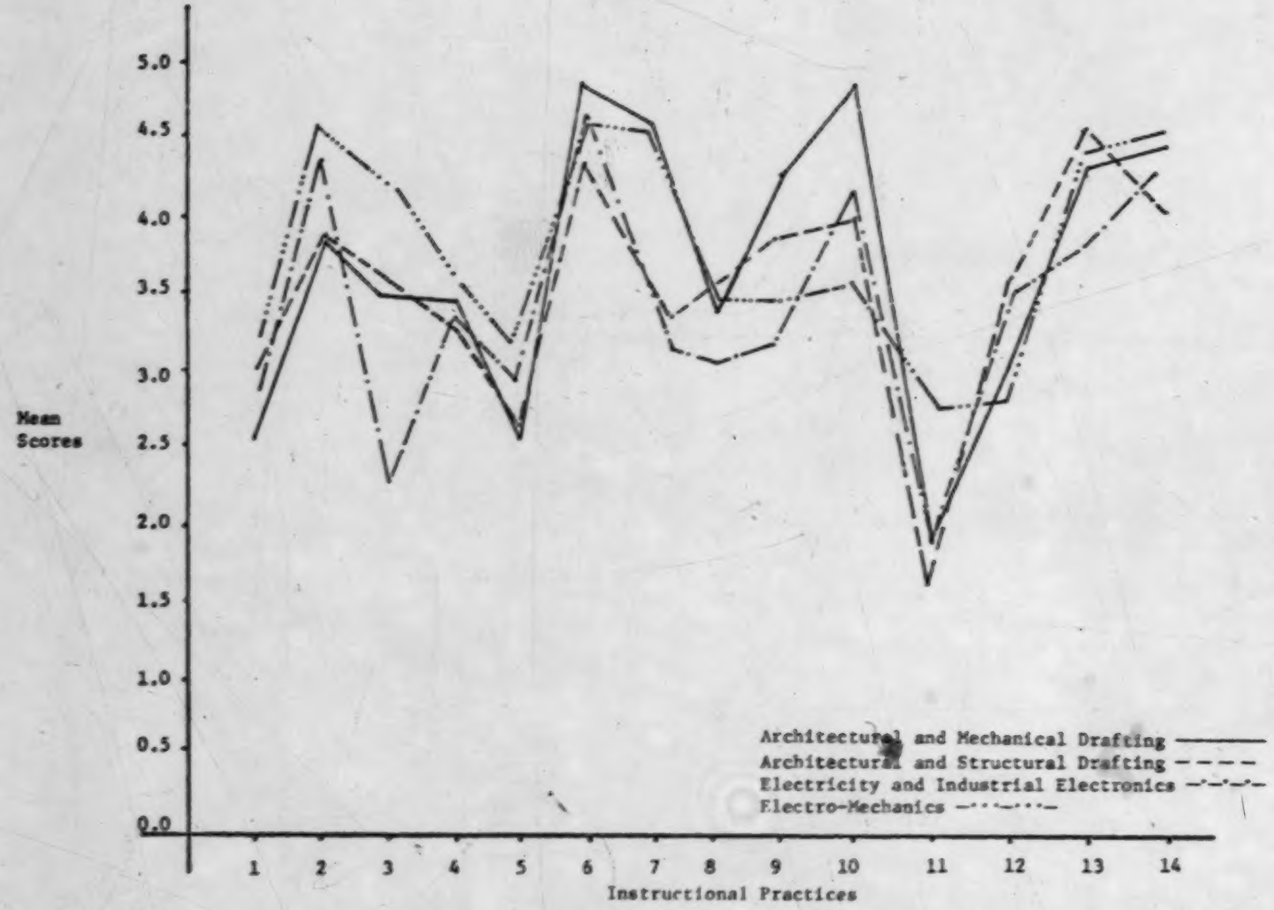


Figure 45

Graphical Presentation of Graduates' Evaluations of the Instructional Practices of Faculty Members in the Technical Division

Table 91

Mean Scores of Main Effects: Instructional Practices

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mean Scores	2.96	4.20	3.44	3.48	2.88	4.72	3.99	3.40	3.74	4.47	2.08	3.34	4.34	4.42

Table 92

Mean Scores of Main Effects: Graduate Groups

	Group			
	Architectural and Mechanical Drafting	Architectural and Structural Drafting	Electricity and Industrial Electronics	Electro-Mechanics
Mean Scores	3.73	3.59	3.47	3.91

Table 93

Analysis of Variance of Graduates' Evaluations of the Instructional Practices of Faculty Members in the Technical Division

Source of Variation	SS	df	MS	F	p
Instructional Practices	262.773	13	20.213	18.53	0.000004
Groups	13.121	3	4.374	4.01	0.007784
Skills x Groups	58.793	39	1.508	1.38	0.066573
Within	519.191	476	1.091		
Total	853.878	531			

Mean Scores
  Practices (Table 91)
  Groups (Table 92)
  Skills x Groups (Table 90)
$p<0.1$

Table 94

Scheffes Multiple Comparison of Main Effects: Difference Among Graduates' Evaluations of the Instructional Practices of Faculty Members in the Technical Division

Groups	Contrast	F	p
1 2	0.145	0.462	0.709263
1 3	0.264	1.532	0.205350
1 4	-0.179	0.655	0.580230
2 3	0.119	0.272	0.845047
2 4	-0.323	0.189	0.129509
3 4	-0.442	0.355	0.014541

Group 1	Architecutral and Mechanical Drafting	N=12
Group 2	Architectural and Structural Drafting	N=9
Group 3	Electricity and Industrial Electronics	N=9
Group 4	Electro-Mechanics	N=8

$p<0.1$